

## SOFTWARE FROM BETASOFT

### GAMES MASTER FOR THE SAM COUPE:

At last YOU can create stunning games and demos for the Coupe, with fast, smooth, animated sprites, complex sound effects, missiles, platforms, lifts, detailed backgrounds etc. No programming expertise required! Most of a game's design is specified by the menu-driven editor, which lets you edit graphics, animation, movement, sprite collision actions, sound effects, masking, control keys etc. A simple but very fast compiled language controls some features. A complex demo with animated bouncing sprites passing over and under each other, in front of a background, can be written with just a few commands to start the sprites off. (Once started, the sprites can act by themselves.) The editor produces stand-alone ROM-independent CODE programs that are free from any copyright restrictions - so you can sell your masterpiece! Impressive demonstration programs and an extensive sprite library are included to get you started. Backgrounds and sprites can also be grabbed from any Mode 4 screen and edited.

SIX SPRITE PLANES PLUS BACKGROUND  
BIG SPRITES - UP TO A THIRD OF THE SCREEN AREA

TRUE COLLISION DETECTION ON SPRITE EDGE

SMOOTH, FAST PIXEL MOVEMENT OVER 100 ON-SCREEN SPRITES

POWERFUL EASY TO USE EDITOR COMPILED CONTROL LANGUAGE

COMPLEX MOVEMENT PATTERNS AND ANIMATION SEQUENCES

STEREO SPRITE-FOLLOWING SOUND EFFECTS

Written by Dr Andy Wright, author of the Sam ROM, MASTERDOS and MASTERBASIC, the program works with 256K or 512K RAM and ROM 2.0 and above. A comprehensive manual is included.

GAMES MASTER COSTS JUST £24.99 INCLUSIVE OF POSTAGE AND PACKING (ADD £1 IF OUTSIDE EUROPE). SPECIAL PRICE TO INDUG MEMBERS: £22.50 (QUOTE MEMBERSHIP NUMBER)

**NEW !!** Secrets of the SAM ROM revealed! The complete ROM 3 source listing on disk, extensively commented by the programmer, Andy Wright. Addresses and memory contents are included to make comparison with the actual ROM easy. The viewing program lets you move lightning-fast through the listing with various step sizes, perform searches, or list any part to a printer or (with MasterDOS) a disk file. A must for the serious SAM user! Just £9.95.

**FILE MANAGER** - The flexible file program. Files up to 790K. Requires MasterDOS and MasterBasic v1.7 or later (updates are free if you return your original disk. Enclose an SAE if you're not buying anything.) £12.99

**MasterDOS** - The DOS for the serious user. Faster, easier to use and more reliable than SAMDOS. Now available EXCLUSIVELY from BETASOFT. Offers RAMdisk and clock/calendar support, subdirectories, BACKUP, serial and random access files, multi-sector READ and WRITE AT, and much more! £15.99.

**MasterBASIC** - The much-praised SAM Basic extension adds many new commands for graphics, sound, printing, data-handling, improving DOS, searching and editing programs, etc. £15.99.

**STILL AVAILABLE:** Beta DOS for the PLUS D. More files per disk, much faster, random-access files, file compression, BACKUP and many other features. Fully compatible with existing disks and files. Only £9.95.

**BETA BASIC** for the Spectrum (40K/128K+2) adds over 100 new commands and functions to Spectrum Basic. Versions available for Discipline/D, Discovery, or Tape/Microdrive. A classic for just £16.95!

Prices include P & P. Make cheques and postal orders payable to:  
BETASOFT, 24 WYCHE AVENUE, KINGS HEATH, BIRMINGHAM, B14 6LQ

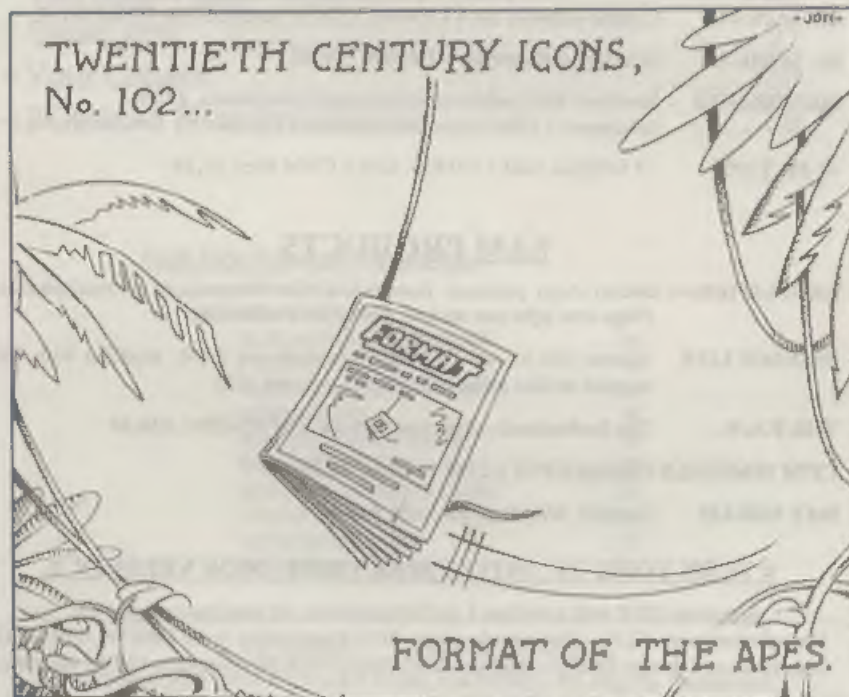
Vol.7 N°8.

April 1994.

# FORMAT

FOR SPECTRUM AND SAM USERS

TWENTIETH CENTURY ICONS,  
No. 102...



FORMAT OF THE APES.

Get Into The Swing  
With **FORMAT**

£1.25 (UK R.R.P.)

ISSN 0963-8598.

# **B.G.SERVICES**

64, Roebuck Road, Chessington, Surrey, KT9 1JX. Tel: 081-397-0763.

## **SPECTRUM PRODUCTS**

- +2A MOD KIT** Converts a black +2A into a genuine +2 with standard expansion port. This allows the PLUS D to operate properly. Includes replacement ROM, FIXER and full fitting instructions + manual updates. **£15.50.**
- THE FIXIT** Converts the +3 and +2a expansion port so that some 48K add-ons will work. Single port version **£9.50**, double port version **£10.50.**
- VTX5000** **SPECIAL OFFER** - V23 direct connect modem with viewdata software in ROM. Version for 48K or gray +2 (+2A/+3 users need FIXIT) - **£10.**
- PD TAPE 01** Comms software for VTX5000, VTX711 and RS232s. **ONLY £1.50.**
- Dr. SCROLL** Scrolling software for VTX5000. **£4.00.**
- MEMBRANES** Spectrum 48K (rubber type) keyboard membranes. **£5.00.**  
Spectrum+ / 128K keyboard membranes **£15.00.** ++ Now Available ++
- +3 PD TAPE** +3 Utilities. Side 1 +3DOS. Side 2 CP/M files. **£1.50.**

## **SAM PRODUCTS**

- SAMPLIFIER** Stereo Amp powered from SAM. Drives speakers or head-phones. Plugs into light-pen socket. **Phone for availability.**
- PRO-DOS LITE** Allows you to run CP/M 2.2 programs on SAM, supplied with full manual on disc and over 1Mb PD software. **£15.**
- THE P.A.W.** The Professional Adventure Writing for PRO-DOS. **£16.50**
- CP/M MANUALS** Genuine CP/M 2.2 DR Manuals **£6.50**
- DAY DREAM** Graphic Adventure for SAM **£4.50**

### **□ TURN YOUR PC INTO A SPECTRUM - NEW VERSION □**

Spectrum 128K with Interface 1 and Microdrives. All emulated on your PC. Unregistered copy **£2.50** Registered version **£15.** (Registration gives DISCIPLE/PLUS D disc reader and design for tape input interface). Ready-built tape interface **£11.50** incl p&p.

### **□ RIBBON RE-INKING SERVICE □**

Star, Citizen and other standard fabric ribbons re-inked for **£1.50** each + return postage.

Please allow 28 days for delivery. All prices include UK postage and packing. Overseas customers please add **£2** on modems; PRO-DOS and +3 CP/M, add **£1** on all other items. Please make cheques/postal orders payable to B.G.Services.

BUS-LV

# **CONTENTS**

Vol.7 N°8.

April 1994.

◆ News On 4 .....	4
◆ The Editor Speaks .....	5
◆ Short Spot .....	7
◆ Machine Code Without The Tears - Part 25 ...	13
◆ BASICally Speaking - Part 6 .....	19
◆ UniDos Corner .....	27
◆ The Help Page .....	29
◆ Small Ads .....	31
◆ Your Letters .....	33
◆ FORMAT Readers Service .....	39

### **THIS MONTHS ADVERTISERS:**

BETASOFT	Back Cover
B.G.SERVICES	2
BLUE ALPHA ELECTRONICS	24
FRED PUBLISHING	12
GLOUCESTER'S APRIL SHOW	21
KOBRAHSOFT	16
REVELATION SOFTWARE	18
RICHARDSON & CO	16
SAM SPEC NETWORK CLUB	24
S.D.SOFTWARE	26
STEVE'S SOFTWARE	32
WEST COAST COMPUTERS	6

### **FORMAT ISSN 0963-8598**

© Copyright 1994 FORMAT PUBLICATIONS. All Rights Reserved.

No part of this publication may be reproduced, in any form, without the written consent of the publisher. The purchaser of this magazine may copy program material published herein for his or her own personal use and provided that any such programs are erased if and when the purchaser disposes of this magazine in any way. While every effort is made to ensure accuracy in FORMAT the publisher will not be held liable for any errors or omissions.

**FORMAT** is published by **FORMAT PUBLICATIONS.**

34, Bourton Road, Gloucester, GL4 0LE, England.

Telephone 0452-412572. Fax 0452-380890.

Printed by D.S.Litho, Gloucester. Telephone 0452-523198.



# NEWS ON 4

## GLOUCESTER IN THE HEADLINES

As most of you will know, Gloucester has been hitting the news headlines over the last month - for all the wrong reasons. The 25 Cromwell Street murders have both horrified and transfixed the city and, so it seems, the rest of the world.

Gloucester, a normally quiet city, boasts one of the smallest police forces per head of population in the UK. Now the deeds of Frederick West have placed Gloucester in the spotlight, the media are having a field day and the police are under a lot of pressure.

Even though it is no longer front page material and the national TV news often has more pressing items to fill their bulletins with, the depressing thing is that, for Gloucester, the story goes on - day after day.

I'm sure readers will join with me in sending sympathies to the families of the poor victims.

## ALL MOVE ROUND

It has been a case of musical chairs this month as both Blue Alpha and West Coast Computers start a big move.

Poor security at the Abernant site has led to major worries for both companies and so, after months of negotiations, it was decided to move the SAM production and development side, under Blue Alpha, to different premises. This leaves Abernant to be used for the storage of less nickable items by West Coast.

Blue Alpha Electronics address is now Ynysforgan Farm, Morriston, Swansea, SA6 6QL. A new telephone number will be available in the next week or so, ring

us at **FORMAT** if you need help.

West Coast will continue to use Format as agents to handle the mail-order and dispatch side of their operation and our provision of office services for them is set to expand over the next six months as they increase their overseas sales operation.

At the same time West Coast have announced the launch of a new advertising campaign which will target console users, encouraging them to upgrade to a real Computer.

## RED HERRING

This is an Adventure lovers dream - a thick bi-monthly magazine devoted to your favourite pastime. Red Herring is already on issue 15 and 16 is in the pipeline. The issue we obtained, number 14, ran to 88 professionally printed pages packed with every type of article an Adventure player could wish for. Certainly one of the best produced magazines I've seen in a long time.

The mag is not machine specific but many of the hints and ideas will serve you well no matter what machine you have.

Red Herring costs £4 per issue although if you subscribe for six issues (1 year) you get a seventh issue free. To order a sample copy send a cheque for £4, made payable to Marion Taylor, to Red Herring, 504 Ben Jonson House, Barbican, London, EC2Y 8NH.

## Credits:

**URGENT** we need your news. Anything you think other people should know about. Each item printed earns the contributor 3 months extra subscription (please claim when next renewing).

# The Editor Speaks

As I write this life has just begun. Yes, the big FOUR OH. No big deal really, I don't feel any older than yesterday - I feel 75+ every day. And, it is only 25 years before I get my bus pass.

Since the demise of the High Street glossy mags there has been a glut of people starting 'so called' PD libraries for the Spectrum. One or two were run quite respectably but they, alas, did not survive very long (RAS PD and the like).

However, there seems to be rather a lot of kids (and yes I know one of the people I am talking about is well past his teens but from the way he is acting he deserves the title of 'kid') who are just getting PD a bad name. One recent case has nearly half a Spectrum disc mag devoted to slagging off the opposition.

A large file of letters is building up here, originating from one side or the other. Many demanding that I take action against the other side.

SO. To set the record straight. Unless I consider an advert to be either illegal, dishonest or misleading, or unless I receive specific complaints from readers about an advertiser, I have to run the adverts for anyone who is prepared to pay the list price. However, I do not have to give them any other form of publicity within these pages unless I approve of them. At the moment I feel quite strongly that PD on the Spectrum should not be encouraged. If software is worth having it should be published in a professional way so that money can be made to write new software. I would welcome readers comments on any PD company they have dealt with on the Spectrum. Give as much detail as you can. If you don't want your comments to

appear in print then just say so, but it would help me to hear your views both bad and good (well there must be one good one out there somewhere).

On SAM the PD scene has been quiet for a long time. But I'm pleased to say that Derek Morgan is now well underway with his new SAM PD set-up (see letters page) and I hope that everyone will give him their support.

Many of you will remember the old days when Software for the Spectrum was available in almost every computer shop and you could buy a program to do almost anything you liked. Well, sad though it may be, those days are gone. Spectrum software is now mail-order only and that, strange though it may seem, is not a bad thing as it allows software to be cheaper as there are no middle men involved. One problem exists though, what happened to all the software that is no longer produced? In an attempt to answer that I would like to hear from readers who have details of unusual programs, we can then try to track down the author and make the software available again.

And finally. There has been a lot of problems this month due to the big move-around in South Wales (see news page) and it may still be a few weeks before everything is back to normal - in the wilds of South Wales BT take their time to connect new phone systems. Still, we are here - any problems we can help with we will. Just give us a ring.

Anyway. Show time is getting near. For more details see the advert. Be there or you will really miss out.

Until next month.

Bob Brenchley, Editor.

# WEST COAST COMPUTERS

## SPECIAL ANNOUNCEMENT

### NEW SAM DISC DRIVES

You have all heard of the problems the slim-line drive shortage has caused SAM over the last two years - well we have the solution. Our design team has perfected a way of fitting standard 3½ inch disc drives economically (and cosmetically pleasing) to SAM. All new machines shipped since the beginning of March have been fitted with the new drives. A single drive 512K SAM, order code W1001, still costs £199.95 but a dual drive SAM, order code W1002, has now come down in price to £259.95 (both prices plus P&P).

### UPGRADING TO TWO DRIVES

Because the fitting of these drives requires alterations to SAM's main circuit board, it is not now possible for users to fit second drives to their machines themselves. Machines will need to be sent to our repair agents Blue Alpha for upgrade. However we are keeping the price of a second drive at £79.95 but this now includes fitting and return (insured) postage. Just give our mail-order agents at Format Publications a ring on 0452-412572 and they will tell you how to return your machine. Special arrangements are being made for overseas customers - please write for details.

### NEW DRIVES FOR OLD

In tests, these drives are proving far more reliable than the old slim-line drives. We are therefore prepared to make you some special offers if you want to upgrade your existing drive at the same time as you have a second drive fitted.

**If your SAM was purchased from us within the last six months.** We will upgrade your existing drive for just £20 when you have a second drive fitted.

**If your SAM is over 6 months old but still under our 12 month guarantee.** We will upgrade your existing drive for a payment of £34.95.

**If your SAM is over 12 months old.** Providing the existing drive is working when we test it we will upgrade you for £49.95. Even if your existing drive is not working we will still offer you a £20 trade-in on the faulty one when you have two new drives fitted.

### EXTENDED WARRANTY

While having new drives fitted, your SAM will be fully tested, if there are any faults discovered you will be notified and given a chance to have them corrected while we have your computer. Blue Alpha have also agreed that for a single payment of £10 they will give your machine a full 'parts and labour' warranty for 12 months. This only excludes the drives (which are covered by our 12 month guarantee) and the power supply/modulator, this will be in addition to any WCC warranty still left on your machine. Not a bad offer I think you will agree. Make your cheque for extended warranty payable to Blue Alpha Electronics.

### For other items - Please see last months advert.

To order machines or any other items please send your order to:-  
West Coast Orders, Format Publications, 34 Bourton Road, Gloucester, GL4 0LE.

# SHORT • SPOT

## YOUR HINTS, TIPS AND PROGRAMMING IDEAS

Edited By:- John Wase.

This month, I've lots and lots of lovely bits and pieces, but must first start with an apology. You know how it is when you are really really busy. Half a dozen extra jobs immediately arrive. So it was when Bob rang and mentioned that he wanted March 'Short Spot', pronto. I was chuffed to death; did it in record time, packed it up, a disc with all the SAM stuff on and a disc with all the PLUS D stuff - Bob likes 5¼" discs for that. So I was much upset when I had a phone call from Bob that I'd left out the text disc (a DOS one, that - three different formats in the pack!).

Fortunately, I now keep copies of everything, and I didn't have too much trouble in duplicating it and taking it down to Gloucester, except the cost, inconvenience, and worst of all, the time. This, of course, produced a knock-on. Bob always edits to fit the space available. This time, due to my stupidity, he was short of time and left out a piece he ought to have put in and put in a piece he ought to have left out. So I must try and put it right now. So; you remember Frank Evans, who, last month, sent me a little algorithm for LCM? Somehow, at the end, he got cut off in his prime. And we printed that it was all a lot of Limericks! What I really meant to say was "Thanks, Frank". The Limerick bit referred to all those poor individuals who have been wading through all these pages to find something creative to do with their SAMs, but still don't know

what to do. J.Smith of Leeds apologises that he couldn't make this poetry competition in time for the closing date, but sends a SAMjob specially for us at 'Short Spot'. It contains four verses, each of similar type, in DATA statements. The computer chooses lines randomly; (well, not quite: chooses one of the first lines at random, then one of the second, and so on). The end result is a five-line poem. They all bear a certain similarity, but they're all different. The comment that "as a collection of Limericks: well, they're awful, but as a SAM advertising stunt; it's great" belongs here, of course. Nice one; many thanks, Mr Smith. Here it is:-

```
10 REM SAM POETRY by J. SMITH
   Oct.93
20 DIM A$(5,4,32)
30 FOR F=1 TO 5: READ B$: LET
   A$(F,1)=B$: NEXT F: FOR F
   =1 TO 5: READ C$: LET A$(F
   ,2)=C$: NEXT F: FOR F=1 TO
   5: READ D$: LET A$(F,3)=D
   $: NEXT F: FOR F=1 TO 5: R
   EAD E$: LET A$(F,4)=E$: NE
   XT F
40 CLS : PRINT TAB 5, "SHEER
   POETRY by SAM": PRINT TAB
   5, "_____": P
   RINT ""
50 FOR f=1 TO 5
60 LET a=INT RND(4)
70 IF a=0 THEN GO TO 60
80 IF a=1 THEN PRINT 'a$(f,1)
90 IF a=2 THEN PRINT 'a$(f,2)
100 IF a=3 THEN PRINT 'a$(f,3)
110 IF a=4 THEN PRINT 'a$(f,4)
120 NEXT f
130 PRINT "" "Another verse?
   Press Y:Q to Quit"
140 PAUSE
150 IF INKEY$="Q" OR INKEY$="q
```

```

* THEN STOP
160 GO TO 40
170 DATA "A friendly computer
called SAM", "Read now how
famous I am", "It's one of
my views", "I'm easy to use",
"Buy me as soon as you can"
180 DATA "A versatile fellow I
s SAM", "You know what a gr
eat guy I am", "To give me
my dues", "I'm not hard to
use", "Try me, become a SAM
fan"
190 DATA "I'm a computer calle
d SAM", "A wonderful thing
that I am", "You'll not sta
nd to lose", "I'll not blow
my fuse", "To please you I
know that I can"
200 DATA "If you wish for a br
and new SAM", "To own one y
ou certainly can", "Don't h
ave the blues", "Three ches
rs it's good news", "Own me
right now if you can"

```

I also have a reply from Frank Evans, who writes somewhat astringently that his intent was brevity rather than obfuscation. Frank has produced a cornucopia of goodies for me, including a large spirograph program to end all spirographs. Although I've finished this topic now, I feel that his comments on LCM and HCF are well worth printing, so they're below. If you want a copy of Frank's Spirograph program, do leave me a message or drop me a line. Frank, has also sent me a five-liner commenting on my unfavourable comparisons of his code with a Limerick.

"There was a young man from Pershore, Who didn't know his AND from his CURSOR. Was this John Wase? That veritable case. Whose life is one round of pleasure!!!"

Well, as doggerel, I guess it wins the big prize. More importantly, Frank mentions that the method used to find the LCM is first to find the Highest Common Factor (also known as the

Greatest Common Divisor) by direct division. This is a recursive process, dividing the lowest number into the larger until zero is reached.

```

Divisor ) Dividend ( Quotient
          Product
          Remainder

```

For the second and subsequent passes, the Remainder becomes the new Divisor, and the Dividend is the old Divisor. When there is no remainder, the process stops, and the last Divisor is the Highest Common Factor.

The Lowest Common Multiple is found by:-

$HCF * (WHEEL/HCF) * (RING/HCF)$

Many thanks, Frank.

Now back to the present. This month several people have been delving into the Spectrum's past history. One reader has sent me several old volumes which I'll refer to later; sadly I've only had time to skim through parts of them. Another, Mr L.G.Baumann, has been delving into odd corners of the ROM. If you look at the code in detail, you will find that there is a 'trap' there which does something to the display file: it's only a few lines of code and is not normally in use. However, you can call it, and Mr Baumann has found that provision is made to extend the normal 32 column screen to a 36 column screen. I'm not an expert: I don't know how this works. The arrangement of the display file is odd, sandwiched right at the start of things. You can have arrangements alike 42 letters across the screen by using character squares only 7 pixels across, but apparently this is a genuine screen, so I guess that since the display file space is fixed (i.e. the number of pixels) there's fewer than the normal 22 rows; can anyone clever sort it out for me, please? Mr Baumann suggests that this

could have been for a further Spectrum that never came out, but I don't honestly think so; my view is that it was written into the ZX81 ROM as a possibility, and no-one took it out when the code was ported to the Spectrum.

Unfortunately, a direct address to be called was not included, so the short program from Mr Baumann builds up the Routine into Memory at Address 60000 from the appropriate addresses in the ROM, and then prints an example as well as the codes used. Mr Baumann can't think of many uses for this sort of screen, though he does mention that 36 columns should be much more useful for tabulations, as it is divisible by 2, 3, 4, 9, 12 and 18. My mind's like our kitchen - the old one was ripped out today by workmen, sink and all, and I'm not thinking right. But all you intelligent readers should be able to incorporate this in your own routines and come up with some ideas for 'Short Spot'. So let's have a little compo; come up with the best idea for using this routine in less than 20 lines of Basic.

Here it is:-

```

10 CLEAR 59999: POKE 60000, PE
EK 10645: LET r$=""
20 FOR f=60001 TO 60010: READ
=
30 POKE f, PEEK a: LET r$=r$+CH
R$ PEEK a
40 NEXT f
50 DATA 3155,468,2082,237,5458
,11387,1041,514,2289,12183:
REM the ROM codes 60 PRINT
"This line prints a normal
length"
70 RANDOMIZE USR 60000
80 PRINT "And this newer line
is 36 characters": PRINT 'r
$
8999 STOP

```

Many thanks, Mr Baumann.

Next to Lee Willis. You remember, Ettrick Thomson slapped my wrists over

him, because I inadvertently included a snippet which duplicated his offering previously. Lee, too, mentions this, though he clearly doesn't hold it against me, for he's sent some more stuff. One is a program for solving quadratics. Simply enter x squared, x and the constant, and the program does the rest.

```

10 MODE 4: CLS #: CSIZE 8,8
20 POKE UDG CHR$ 144,96,16,32
,112,0,0,0,0: POKE UDG CHR
$ 145,16,16,124,16,16,0,12
4,0: POKE UDG "-","0,126,0,
0,0,0,0,0: BLOCKS 0
30 PRINT " INPUT NUMBER OF X
",CHR$ 144,"s"
40 INPUT #2: AT 3,1: LINE a$
50 LET A=VAL a$
60 LET Equ$=STR$ INT a+"X"+CH
R$ 144
70 CLS 1
80 PRINT " INPUT NUMBER OF X
"s"
90 INPUT #2: AT 3,1: LINE a$
100 LET B=VAL a$
110 LET Min=B<0
120 LET Equ$=Equ$+("-" AND Min
)+"+" AND NOT Min)+STR$ (
ABS B)+"X"
130 CLS
140 PRINT " INPUT THIRD VALUE
"
150 INPUT #2: AT 3,1: LINE A$
160 LET C=VAL A$
170 LET MIN=C<0
180 LET Equ$=Equ$+("-" AND Min
)+"+" AND NOT Min)+STR$ (
ABS C)
190 CLS
200 PRINT AT 0,0,"EQUATION TO
SOLVE :-"
210 PRINT AT 2,(24-LEN EQU$)/2
,EQU$
220 LET D=B-B*B
230 LET E=B*B
240 LET F=A*C
250 LET G=2*A
260 LET H=E-(4*F)
270 IF H<=0 THEN PRINT "UNABLE
TO SOLVE QUADRATIC !": ST
OP
280 LET H=SQR H
290 LET EquTwo$=STR$ D+CHR$ 14
5+STR$ H
300 PRINT AT 5,(26-LEN EquTwo$
)/2;EquTwo$

```



```

310 PRINT AT 6, (26-LEN EquTwo$
) / 2; STRING$(LEN EquTwo$, "
")
320 PRINT AT 8, (26-LEN STR$ G)
/ 2; G
330 LET SOne=(INT (((D+E)/G)*
100)+.5)/100
340 LET STwo=(INT (((D-E)/G)*
100)+.5)/100
350 PRINT AT 9,0;"X=";SOne; AT
11,0;"or"; AT 13,0;"X=";S
Two

```

There's a tale about this, too. I'd not long had the disc when there was a telephoned plea from Lee "Send me a copy of my disc, quick, perleaze". It seems that it was part of a project or something, and Lee had sent me one and kept the duplicate. And promptly corrupted it. By the time he reads this, he should have eight copies. We all know SAM's bad habits, though, don't we. For crying out loud, ALWAYS keep things in duplicate on two separate discs. (And don't mention 'Word for Windows' to me: it sets me off in an enormous fit of temper).

The next thing Lee has sent is a snappy HCF job: no, not a complete Spirograph: just the HCF bit. So we'll add that...

```

10 IF x>y THEN LET z=x,x=y,y=
z,z=0
20 LET LCM=((x*y) AND (y MOD
x))+(y AND NOT (y MOD x))

```

And finally, I've got a real one-liner. A proper Short Spot for April. Here's 'Fancy-End'.

```

POKE ((DPEEK 23200)=16384),255,2
55

```

What's it do? Do? Why, put it as the last line of your program and RUN the program. The listing will mysteriously vanish from your computer, leaving you with a neat OK message at the end. Nice one, Lee.

Lee also includes a load of hidden files with a title screen with a scrolly demo I

can't really read and lots and lots of music. Fine. It would have been better without, though; instead, a letter would have been great, so that I don't have to squint at a SECOND screen all the time, while I'm typing on the first. And by the same token, make sure your address is on the paper.... Lee nearly didn't get his project discs....

Many thanks, Lee...

Now, you will remember last month I cut Ettrick Thomson off short. So here's some more. Ettrick mentions that the equation that Ted Cooke-Yarborough dealt with in February's 'Short Spot' lends itself to all sorts of interesting computer programs. One of the most interesting is a Bifurcation diagram or Feigenbaum diagram (called after Mitchell Feigenbaum) for the equation. The program plots a graph with p as x co-ordinate and x as y co-ordinate. For each of the 256 values of p, 100 successive values of x are plotted: not the first 100, but the second hundred; the idea being that the values plotted are independent of the initial value (chosen arbitrarily as 0.5), and show what happens in the long run. The graph covers the values of p from 2.75 to 4, with graduations every 0.25. This range of p has been chosen to show the interesting phenomenon that Ted mentioned in February. For p<1, x tends to zero, and for 1<p<3 to 1-1/p, and so in the range 2.75 to 3, the graph goes from 0.636.. to 0.666.., but in the critical region, just less than 3, which Ted mentions, it evidently has not settled down after 100 iterations. Immediately above 3, x alternates between 2 values; the diagram does not show the alternation; just the fact that there are 2 values. Then, as p increases, there are 4 values, then 8 values, then 16, then....

But, round about p=3.57, chaos sets in, and continues until p=4, with occasional returns to order, notably round about p=3.83, where x has 3 values, then 6, then... then more chaos.

The program can be altered to cover any range of p,x; one easy alteration is to change the first statement of Line 110 to LET p=3.5+u/510; the graduations drawn by Lines 10-30; have to be interpreted as 3.5, 3.6, 3.7,... 4.0. This shows the chaotic region in greater detail. The program will run either on Spectrum or SAM.

```

5 REM Feigenbaum diagram
7 REM Ettrick Thomson
10 FOR p=2.75 TO 4 STEP 0.25
20 PLOT (p-2.75)*204,0: DRAW
0,172
30 NEXT p
40 FOR x=0 TO 1 STEP 1/4
50 PLOT 0,x*172: DRAW 255,0
60 NEXT x
100 FOR u=0 TO 255
110 LET p=2.75+u/204: LET x=0.
5
120 FOR i=1 TO 100
130 LET x=p*x*(1-x)
140 NEXT i
150 FOR i=1 TO 100
160 LET x=p*x*(1-x)
170 PLOT u,172*x
180 NEXT i
190 NEXT u

```

There's still more left for next month, too. Many thanks, Ettrick.

While we're on the subject of chaos (like our dining room, piled high with boxes full of what ought to be in kitchen cupboards if there were any), I've also got a little bit of chaos from W.T.Buxton of Sale in Cheshire. Bill writes with a somewhat similar Basic program which can be reduced to six lines if needed, and which demonstrates Hunt and Johnson's formula numerically.

With the input of any given value of X (0 to 1) and P (1 to 4), this program calculates the numerical value of X

obtained in the one n+1 calculation which is then used for X in the next n calculation. The resultant values are then listed to infinity and each one can be compared with its neighbours without having to do any more calculations. Bill finds that examining these values gives one an interesting insight into the complex and chaotic nature of the oscillations between calculations, suggesting *FORMAT* readers will want to investigate.

Well, I guess that Ettrick has done a fair amount of investigation already, but we're always game for more, aren't we...

```

10 REM CHAOS
20 REM Numerical demonstratio
n by W. T. Buxton
30 INPUT "INPUT X(0 TO 1)=";X
40 INPUT "INPUT P(1 TO 4)=";P
50 PRINT "IF X.n+1=P*X.n*(1-X
.N)": REM Equation of HUNT
AND JOHNSON SEE IEEE Spec
trum Nov 1993
60 PRINT
70 PRINT "FOR P=";P,"X=";X
80 PRINT
90 PAUSE 50
100 PRINT " Then X.n+1 = ";P*X
*(1-X)
110 PRINT "-----"
120 LET X=P*X*(1-X)
130 GOTO 70

```

Many thanks, Bill.

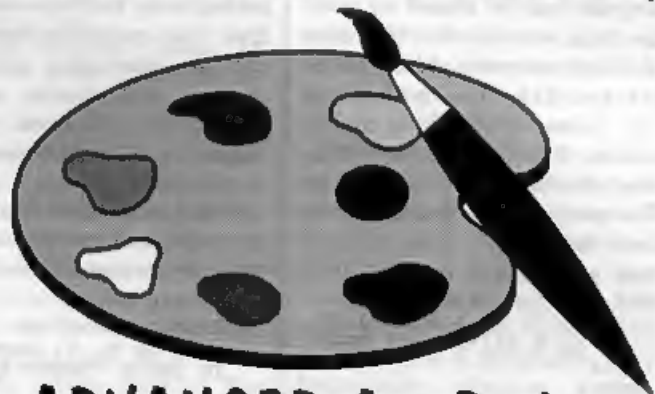
Let's end with the usual plea to send all your bits and pieces to:-

**John Wase,  
Green Leys Cottage,  
Bishampton,  
Pershore,  
Worce,  
WR10 2LX.**

Without them, this column wouldn't get done and there would be a very large hole in *FORMAT*.

Thank you.

# SAMPaint



## The **ADVANCED** Art Package For The SAM Coupé

"excellent... very impressive... brilliant... the best... superb... astonished... quality... real professionalism..." Carol Brooksbank, *FORMAT* February 1994.

We could spend page upon page quoting from Carol's review or listing the features of SAMPaint.

But the fact is, SAMPaint sells itself. It has every SAM owner talking about it, it even has a lot of 16-bit owners jealous! And who can blame them when we've implemented almost all the features from their art packages and more...! If you still need convincing, get in touch and we'll send you a list of the main features.

"No other art package can be taken seriously after SAMPaint - an artist isn't an artist without it."

*R.R.P. £24.99 - INDUG Members Price £22.50*



For SAM Coupé  
With 512K Memory

Send payment with order to:-

FRED PUBLISHING 40, Roundyhill, Monifieth, Dundee, DD5 4RZ. Tel: 0382 535963

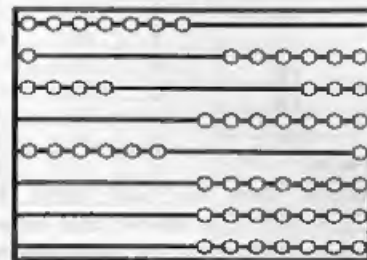
## MACHINE CODE

### WITHOUT THE TEARS

Part 25.

By:- Carol Brooksbank.

### COUNTING



We normally calculate and count in the decimal - or denary - system, using 10 digits 0-9. This is the system which comes naturally to humans, because we are born with five digits on each hand, and we all learn to count on our fingers.

But there are other systems of counting, and they are frequently used in the computer world. Binary uses only 2 digits, 0-1. Hex uses 16 digits, 0-9 and the letters A-F. Octal uses 8 digits, 0-7.

To understand how these other systems work, it is vital to understand what we do when we count in denary. Normally we don't stop to consider what we are actually doing when we count, say from 1 to 100. We know what to do so we do it. But let us analyse the process.

We have 10 digits, so counting from 0-9 is no problem:-

0  
1  
...  
8  
9

But now we have run out of digits, so we start a new column to the left of the one we have been using, put 1 in it, start back at 0 in our original column and carry on:-

10  
11  
...  
18  
19

When we run out of digits again, we add 1 to the left column, and start again at 0 in the right:-

20  
21  
...  
29  
30

This goes on until we run out of digits again in both columns, when we repeat the process - add another column to the left, put 1 in that, change the ones on the right to 0 and carry on as before:-

99  
100  
101

and so on. Every time all the columns are at 9, we can invent a new one at the left. There is no limit to the size of number we can express using the system, because we can use as many columns as we like.

The process is exactly the same in all the other systems, the only difference being the number of digits available. In binary, where we have only 2 digits, we have to bring in new columns very

frequently, and so the numbers are generally longer than denary numbers:-

BIN	DEN
0	0
1	1
10	2
11	3
100	4
101	5
110	6
111	7
1000	8

By the time we have reached denary 8, binary is a 4-figure number. The usual convention is to express all binary numbers up to 255d as eight digit numbers, so 7d is 00000111bin.

So why use binary? Binary is the only system your computer understands. All its memory locations are capable of holding 1 number between 0-255d, 00000000-11111111bin. You can think of each memory location as a bank of 8 tiny switches, switched on or off according to the bit status of the binary form of the number held there. The current can only flow through the 'on' switches (set bits), and it is the combination of switch settings which causes the processor to perform various operations. That is what you are doing with machine code programming - setting the banks of switches in the right pattern and order to get the result you want.

If you program in Basic, the Basic interpreter converts the Basic commands to a series of machine code binary instructions, and the operating system can also convert denary input, because that is what most humans are likely to use. Binary is much too cumbersome for everyday use.

Hex - short for hexadecimal - is another counting system, working in exactly the same way as the others,

except that there are now 16 digits, the letters A-F being used as numerical digits in addition to 0-9. The use-the-digits-up-then-bring-in-a-new-column system is used again.

0
1
...
E
F
10
...
FE
FF
100

and so on.

Because there are more digits, hex numbers tend to be shorter than denary. Numbers up to 255d are two-figure hex numbers, and up to 85535d are four figure hex numbers. We usually express hex numbers as two or four figures - 13d = 0Dh, 16384d = 4000h. To avoid confusion between numbers which look the same in both conventions, we reserve the usual way of saying numbers for the denary system, 10d is 'ten' 10h is 'one-oh-hex'.

So why use hex? Its number base is 16,  $2^2 \times 2^2$ , so there is a closer relationship between the binary numbers your computer understands and hex notation, than there is between denary and binary, but it is less cumbersome than binary. The 16 hex digits cover every possible combination of bit settings in a 4-digit binary number. (see Table A).

It is much easier to see the relationship between a number's MSB and LSB in hex than in denary. You know that the computer stores a number above 255 in two locations, or in a double register, in the form of  $MSB=INT(n/256)$ , and  $LSB=n-(256*MSB)$ . Take the denary

TABLE A. HEX-BINARY-DENARY EQUIVALENTS.

HEX	BIN	DEN
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
A	1010	10
B	1011	11
C	1100	12
D	1101	13
E	1110	14
F	1111	15

To convert between HEX and BINARY.

Convert each hex digit to the 4-digit binary number, or each group of 4 binary digits to the equivalent hex digit.

e.g. CBh = 11001011bin

bin 1100101100110111 = 1100 1011 0011 0111

C B 3 7

To convert an 8 bit binary number to denary.

Add together the denary values for each set bit.

7	6	5	4	3	2	1	0	Bit Number
128	64	32	16	8	4	2	1	Denary Value

So, bin 00110111 = 32+16+4+2+1 = 55 denary.

To convert a 16 bit binary number to denary.

Multiply the value of the MSB (bits 8-15) by 256 and add the value of the LSB (bits 0-7).

So bin 11001011 = 128+64+8+2+1 = 203

$203 * 256 = 51968$  when this is the MSB.

Add the 55 calculated above for the LSB, and

bin 1100101100110111 = 51968+55 = 52023.

number 12345. Its MSB is 48 and its LSB is 57. There is no obvious connection between MSB and LSB unless you do the calculation. But in hex it is different. The hex equivalent of 12345d is 3039h. The MSB is 30h and the LSB 39h. You can see at a glance what a number's MSB and LSB are. Check these hex numbers in Tables A and B to see for yourself that they are the same as the denary equivalents.

If you like the look of hex - if it intrigues you and you would like to learn it you will find that in the end it makes machine code programming easier. The books by William Tang or Toni Baker, which I mentioned last month, will help you learn it.

If you don't like the look of it - if it seems fiddly and unnecessary, it will only put you off machine code altogether if you force yourself to learn it. If you have two programmers doing the same job, one fluent in hex and one fluent in denary, each working in the convention they like, the one working in hex will

usually get on faster. But if you have two programmers, one working in hex because he thinks he ought to but not really happy with it, and one working in denary, the one working in denary will win hands down.

So don't let anyone tell you you must work in hex. Unless it makes life easier for you, stick to denary. When you come across hex in listings, your assembler will almost certainly do the conversion for you. If not, Table A and a calculator will let you convert hex-denary.

Table A shows you the relationship between hex, denary and binary. We have used binary quite a lot in this series already. Generally, if you need to think about individual bits rather than the number as a whole, it is easier to work in binary. But you can enter the bit patterns you need as binary numbers and you don't then need to worry about the denary equivalent of the number. If you need to convert between conventions, Table A will help.

The other convention used in



# KOBRAHSOFT

## Spectrum & Sam Coupé Utilities

**SAM DICE DISC UTILITY.** NEW! Ver. 1.1 compatible with MasterDOS. Features READ, BACKUP, RECOVER erased files/lost data, REPAIR directories, DISC CHECK, LOCK OUT bad sectors, SEARCH for string, RENAME files, FORMAT all or just one track. Directory listing shows HIDDEN & ERASED file - recovered with one key press. Read file headers. Easy to use. Price:- £14.95 on disc, plus £0.45 P&P.

**SAM 280 MACHINE CODE COURSE.** NEW! Learn how to program your SAM Coupé in machine code. FULL course, suitable for all, with an assembler and disassembler. Price:- £20.00, plus £0.74 P&P.

**SP7 TAPE TO +3 DISC UTILITY.** Transfer Spectrum tapes to +3 disc. Comes with a BEGINNER'S manual, an ADVANCED user's manual and an Encrypter demo tape. Also a superb DISC CATALOGUER. Transfer FULL 128K programs. Includes SP7 Companion - shows how to transfer many games. Price:- £14.95, plus £0.74 P&P.

**STILL AVAILABLE:-** GH1 Games Hacker Utility, DMS +3 DISC Management System, D.L.C.E. +3 Disc Utility, Spectrum Machine Code Course, DB2 +3 Disc Backup Utility, +3 Diary & Filing System, SD5 Tape to M/D utility, SO5 Tape to Opus utility, MT1 M/D Toolkit, SW1 Tape to Wafadrive utility, CT2 Sam Tape utility, SMI Multiface Suite, SP7 Companion Vol. 2, SC7 tape backup utility. Please ring for FULL details.

**MONEY BACK GUARANTEE - BUY WITH CONFIDENCE.**

**UPDATES:-** Send old disc, tape etc. Plus 1/2 new price for latest version.

Send cheque/P.O. to:- KOBRAHSOFT, Dept. F, Pleasant View, Hulme Lane, Hulme, Longton, Stoke-on-Trent, Staffs, ST3 5BH.

Postage:- U.K. as above, Europe add £1 per item, others add £2 per item. Send SAE (9"x4") for detailed FREE catalogue. Please mark envelope "ENQUIRY".

**FOR MORE INFORMATION PLEASE PHONE 0782 305244.**

ACCESS and VISA welcome - please phone above number (24 Hr, 7 Day Service for FAST Mail Order)



# sinclair



**W.N.RICHARDSON & CO**  
(EEC)

**QL & SPECTRUM PRICES REDUCED**  
QL £85 SPECTRUM +2 & +2A £70 SP+3 £80

**KEYBOARD MEMBRANES NOW AVAILABLE**  
FOR SPECTRUM+ AND 128 £12 EACH.

**\* MICRODRIVE EXPANSION KIT \***

Includes microdrive & interface 1, board, introduction cartridge, flex connector & wallet of 4 cartridges ..... £59.95  
As above with extra microdrive ..... £68.00

NEW MICRODRIVES.....£24.95 - 2 for £40 (with connector)

**\* SPECTRUM POWER SUPPLIES \***

SPECTRUM PLUS AND PLUS 2 £9.99  
BLACK PLUS 2 AND PLUS 3 £12.25  
(QTY DISCOUNTS AVAILABLE)

**\* MICRODRIVE CARTRIDGES \***

4 new cartridges in wallet ..... £10.00  
20 in plastic box with separators ..... £50.00  
8 new program cartridges for reformatting in wallet ..... £15.00

**\* UNIVERSAL 3.5" DISC DRIVE FOR MICROS \***

1Mb and 2Mb 3.5" case, complete with built-in PSU, mains switch & 13amp plug. EXTERNAL dip switches adapt drive for Spectrum, QL, PC, Atari, Amiga etc. Comes with full instruction book, and free DS400 disc. (DS410 with 2Mb) Price includes free lead.

(Spectrum & QL need 1Face) - Disc Drive ..... 1Mb £89 2Mb £99  
Additional leads - for above ..... £12  
Uncased 3.5" Disc Drives - low profile ..... 1Mb £26 2Mb £38

VISA

Add postage £3. Disc Drives £8  
Outside UK add £15. Other items £5. C.W.O. or Visa/Access

ALL OFFERS SUBJECT TO AVAILABILITY  
Spectrum may be reconditioned



Orders to:-  
18-21 Milbourne House, Chiltern Hill,  
Chellont St Peter, Bucks, SL9 9UE.  
Fax: 0753 887149 Tel: 0753 888966

computing is octal. The columns system is exactly the same as in all the other counting systems, but now there are only 8 digits, 0-7. Octal digits cover every possible combination of bits in a 3-figure binary number.

Octal is not, as far as I know, used in the Sam/Spectrum world very much - I have never come across a Sam/Spectrum machine code listing in octal. But it is widely used in the computer world as a whole, so you should be aware of it. Some Sam/Spectrum assemblers will let you enter octal numbers if you wish.

All assemblers will let you enter denary numbers as they stand, but will usually require a prefix for any other convention. Mine (ASTRUM+ for the Spectrum - I write all my machine code programs on the Spectrum, even the Sam ones) uses the following forms:-

nnnn Denary (decimal) number

#nnnn Hex number

\_nnon Octal number

@nnnn Binary number

"abc" ASCII codes for characters within "" are stored.

Your assembler may be different. & and H are often found as hex prefixes. B or BIN may be used for binary. Some assemblers let you switch into hex mode and then enter hex numbers without prefix and need a D before denary numbers. Your assembler handbook will tell you what you need to do.

With the help of the tables I have given you here, and your assembler, you should be able to use any machine code listings you find in print.

So there we are, the end of the series. But for you, it is only the end of the beginning. Because I hope you will be striking out on your own, writing your own routines and programs, and sharing them with the rest of us by writing them

up for **FORMAT**, of course.

This series has run for well over two years, since August 1991, in fact - we have missed one or two months when there have been special Christmas or Anniversary issues of **FORMAT**. Several people have been kind enough to congratulate me on "Machine Code Without The Tears", but the real congratulations belong to you, who have stuck with me all this time and now know the fundamentals of machine code. Don't try to remember it all. Look back to previous articles to refresh your memory. The real secret of being a good machine code programmer is not knowing all there is to know, but knowing where to look it up when you need it.

What am I going to do now? For a start off I am going to ride off into the sunset for a bit, before our beloved Editor finds some other two-year project to keep me out of mischief. It is spring 1993 while I am writing this. So, while you slave over a hot keyboard, I plan to sit in a deckchair this summer, sip something long and cool, and hope it will be some time before the phone rings and a voice says "Bob here. I've had an idea..."

'Bye for now.

# THE END

NOW  
AVAILABLE

# DRIVER

Needs  
MasterDos  
To Run

The new *Graphical User Interface* for the SAM Coupé

Works with Sam Mouse (or Keyboard) to provide a full WIMP\* system just like the professional computers use. Puts you in full control of your SAM - comes complete with many built in utilities and ready to run applications. Also has a full disc-based tutorial to get you started really quickly.

Fantastic Value on disc with full manual £29.95 (INDUG members £24.95)

\* WIMP = Windows, Icons, Menu and Pointers

- **CAMPION** - The Spreadsheet\* versions for both SAM and Spectrum (DISCIPLE or PLUS D). Featuring over 70 built-in functions and ready made formula, this program is easy to use and yet powerful enough to rival many expensive PC programs. A very comprehensive manual (over 80 pages, with lots of examples) Available now at £29.95
- State which computer version and disc size required. **INDUG members price £24.95.**

## OTHER SERIOUS SAM SOFTWARE AVAILABLE FROM Revelation

- > **THE SECRETARY** - The most advanced word-processor available for SAM, powerful, versatile and easy to use. - £14.95 (£12.95)
  - > **SOUND MACHINE** - Make beautiful music with your SAM - Only £14.95 (£12.95)
  - > **COMET Z80 ASSEMBLER** - The professional one - £29.95 (£24.95)
- Prices in brackets ( ) are for INDUG members.

## SAM GAMES AVAILABLE FROM Revelation

☆☆NEW☆☆NEW☆☆NEW☆☆NEW☆☆

### LEGEND OF ESHAN

A GAME LIKE NONE OTHER BEFORE ON SAM.

This graphic game of strategy and adventure takes you into a vast world of demons and warlords.

As Eshan you must raise an army to save the beautiful land of Avinell from the terror of Barquin the Witchking and his hordes. With your friends and followers you must rescue Avorell the Noble and restore him to his palace.

This is not an arcade game, this is not an

adventure, this is something *very special*. Legend Of Eshan works with keyboard or joystick and is also fully Mouse-compatible. Comes complete with comprehensive instructions and a map of the lands of Avinell.

£14.95 (£12.95 to INDUG members)

### ALSO AVAILABLE

• **WOP GAMMA** © A Super-Fast 'Boulder Dash' game with **FAST Full Screen Scrolling** - '99' Levels. ↵

£9.95 (£8.95 to INDUG members)

Other Games Still Available - send SAE for list

**URGENT - PROGRAMMERS NEEDED FOR SPECTRUM & SAM** - Send sample of your work.

- All prices include UK postage and packing. Overseas add £1 surface, £2 airmail.
- Payment by UK cheque, Eurocheque or PO, Payable to Revelation Software.
- Please quote INDUG membership number clearly on order if claiming discount.

• Send orders to:-

**Revelation Software,**  
PO Box 114,  
Exeter,  
Devon,  
EX4 1YY.

# Revelation Software

REVADE-L

# BASICally Speaking...

Part 6.

By:- David Finch.

Welcome. Firstly I would like to make a correction. Line 60 of the program which we typed in last month is slightly wrong. The purpose of this line is to check that we have a filename, which is entered in another part of the programme. The scrabble rack will have ten blanks if no name has been entered, so we don't want to save. Add line 5:-

```
5 DIM b$(10)
```

This creates a blank string called b\$, with ten blank spaces in. We can compare this to fname\$(or f\$ for Speccy) to see if we need to save.

Change line 60 to:-

```
60 IF fname$<>b$ THEN SAVE fname$ SCREEN$(SAM)
60 IF f$<>b$ THEN SAVE f$ SCREEN$(Speccy tape)
60 IF f$<>b$ THEN SAVE d1;f$ SCREEN$(PLUS D,DISCIPLE)
```

Secondly, it has been brought to my attention that GOSUBs within GOSUBs work perfectly well (thanks to Ettrick Thomson and Roy Burford). In my defence, your honour, I used GOSUBs within GOSUBs when writing a program for a friend once. The Spectrum crashed every time the program ran and so I've blamed GOSUBs ever since. So folks, GOSUB as much as you like - within reason of course. The pie chart program will go ahead as previously written. Sorry for any inconvenience, normal service will resume shortly.

Now, back to business. I would like to recap on what you should have so far with the input procedure (note, this is

not inputdata, that will come later).

SAM

```
560 DIM n$(s)
570 LET c=1
580 DO
590 PRINT INVERSE 1;AT y,x;n$
600 PRINT INVERSE 1;PEN 2;AT y,x+c-1;n$(c)
610 GET k$
620 LET n$(c)=k$
630 LET c=c+(c<>z)
670 LOOP
```

Spectrum users make necessary changes to lines 580,600 (PEN to INK),610,670 as instructed last month.

Instead of typing in all the LETs before we run the above, all the SAMsters can turn it into a procedure:-

```
540 DEF PROC inpu x,y,z
690 END PROC
```

Now you can type: inpu 1,1,20 to try the procedure as you did last month. Spectrum programmers, I'm afraid you have to type in your LETs. You can add:-

```
540 REM inpu
```

for neatness. It is not essential but makes the program easier to follow. You may also like to add 539 STOP to prevent the 'procedure' from running accidentally after running line 530. This shouldn't happen, but taking precautions like this prevent unexpected factors, or modifications to the program, from causing further problems.

```
690 GOTO x
```

This is like END PROC. The variable x must be set before we GOTO this part. We could use GOSUB and RETURN.

There is another problem with the

procedure. You cannot delete or move the cursor back and forward. We need to sense if the key pressed (k\$) is the delete key, or the arrow keys. We use the CHR\$ command for this: Every letter is represented in a code called ASCII by a number. For example PRINT CHR\$ 65 does the same as PRINT "A" since 65 is the ASCII code for capital A. You can make a condition to sense if the A key has been pressed using IF k\$=CHR\$ 65 THEN... Similarly, you can sense if the delete keys or arrow keys have been pressed since their codes (on the Spectrum and SAM), are 8, 9 and 12 for LEFT, RIGHT and DELETE respectively

Change line 620 to 650, and line 630 to 660, then enter the following

```
620 IF k$=CHR$ 8 THEN LET a=c-
(c<>1): LOOP
630 IF k$=CHR$ 9 THEN LET a=c+
(c<>z): LOOP
640 IF k$=CHR$ 12 THEN LET n$(
c)=" ": LET c=a-(c<>1): LO
```

(Spectrum users type GOTO 590 instead of LOOP.)

The first line decreases the cursor by one, so long as it isn't the first space, when the left arrow key is pressed (if this confuses you, see the last bit of part 5). The second line detects the right key and increases the cursor if it is not the last (there are z spaces). The third makes the current cursor position blank (deletes it) and takes the cursor back one as in line 620.

Our procedure must now sense when RETURN (ENTER) is pressed and finish the procedure. At the moment the procedure will loop infinitely. We need to test if RETURN is pressed, and exit the loop if it is. The ASCII code for the RETURN is 13, so we must change line 670 to.

```
670 LOOP UNTIL k$=CHR$ 13
Or for Spectrum users (you are a
nuisance!):-
```

```
670 IF NOT (k$=CHR$ 13) THEN
GOTO 590
```

I was kidding about you being a nuisance, sorry folks. They say sarcasm is the lowest form of humour and I'm wasting precious *FORMAT* ink while I should be telling you that the next procedure we are going to do is 'setup'. This procedure allows the user to input the title of the pie chart, the filename it is to be saved as, and the number of sectors (pie wedges) which are needed. The procedure is quite simple. It clears the screen with our clr procedure, prints the titles for the information required then allows the user to type in the information

```
330 DEF PROC setup (SAM)
330 REM setup (Spec)
340 clr (SAM)
340 LET z=350: GOTO 700: REM c
lr (Spec)
```

Note that this sets variable z to 350 so that clr can GOTO 350 when it has finished. Procedures do this automatically for SAM users.

```
350 PRINT INK 2; AT 1,13;"SET
UP"
360 INK 1
```

SAM will convert INKs to PENs for you automatically, since SAM uses the PEN command instead.

```
370 PRINT AT 5,2;"How many sec
tors?"
380 PRINT AT 8,2;"Title?"
390 PRINT AT 12,2;"Filename to
save?"
400 PRINT AT 5,1; INK 4;""
410 DO: REM Spectrum users omi
t
420 INPUT #2; AT 5,19;sec (SAM
)
420 INPUT sec (Spec)
```

Of course, that the SAM needn't input from the lower screen area, by adding #2,

# GLOUCESTER'S 2ND SPECTRUM & SAM COMPUTER FAIR

STAND BOOKINGS  
CONTACT  
FORMAT PUBLICATIONS  
0452 412572

Everything  
Spectrum & Sam  
Under One Roof

SPONSORED BY  
**FORMAT**

HARDWARE - DISCS - PRINTERS - SOFTWARE  
SPECTRUMS - GAMES - WORD PROCESSORS  
SPREADSHEETS - SAM COUPE - MONITORS  
UTILITIES - CABLES - POWER SUPPLIES - MAGS  
KEYBOARDS - DISC DRIVES - SPARES

**SPECIAL BRING & BUY STAND**  
GET RID OF YOUR SURPLUS COMPUTER GEAR

**SATURDAY 30<sup>th</sup> APRIL**  
**10:30<sup>am</sup> to 4:30<sup>pm</sup>**  
**QUEDGELEY VILLAGE HALL**  
**BRISTOL ROAD, QUEDGELEY**  
**GLOUCESTER**

**TICKETS:-** Available on door £2.00 each or Family Ticket £5 (2 adults and up to 4 under 16s)  
In advance, £1.25 and £3.50 (see last month's *FORMAT*)

## How To Get There

If you are travelling north on the M6 then take exit 12 and follow signs for Gloucester. A short distance after leaving the motorway you come to a roundabout from which you take the second exit (A38 towards Gloucester). Now take the first left onto the B4008 which is sign-posted Quedgeley and Severn Vale Shopping Centre. Go straight over at the next roundabout. The hall is then on the left. Just before you reach another roundabout. There is a large free car park as part of the Severn Vale (Tesco) shopping complex, just round the corner.

For those of you coming south on the M5 there are two choices. Junction 12 is not available southbound so it is easier to continue to exit 13 and then turn north onto the A38 - this only adds about 5 miles to the journey and avoids the traffic around Gloucester. The alternative is to exit at junction 11 (the A40 exit) and follow signs for Gloucester - follow the ring-road around - you eventually get signs for M5 South and Quedgeley. Finally you come to a roundabout with the local British Telecom offices on the left. Follow signs for Severn Vale Shopping Centre (see above for more details).

By Rail or Coach. Both the railway and coach stations are in the centre of Gloucester - almost next to each other. Buses run from the coach station to Quedgeley every 15 minutes (about a 10 minute journey). Ask the driver for Tesco's - he will know where you need to get off.

**DON'T MISS IT - DON'T MISS IT**



to the start you instruct it to input from the main screen (like a PRINT command), AT the specified print position. This is not available to Spectrum owners, tut tut Sir Clive!

```
430 LOOP WHILE sec<>INT sec OR
  sec<1 (SAM)
430 IF sec<>INT sec OR sec<1 T
  HEN GOTO 420
```

The above line ensures that sec (the number of sectors) is an integer (whole number). The function INT converts a number to the same number without any decimal fraction. If the INT number is not the same as the inputted number then the inputted number can't be a whole number. It is important that sec is whole because we can't have four and a half sectors, for example. It also causes the user to input the number again if it is less than one (ie zero or negative).

```
440 PRINT AT 3,1;" * 450 PRINT
  AT (,1;INK 4;"**
```

These stars print beside the titles to indicate which is being inputted. Line 440 erases the previous one, and 450 prints the next.

```
460 inpu 1,9,30 (SAM)
460 LET x=1: LET y=9: LET z=30
  : LET r=470: GOTO 540: REM
  inpu (Spec)
```

Do you see why procedures are easier? This allows you to type in the title, maximum length 30 characters. It is produced in the form of n\$.

```
470 LET t$=n$
```

t\$ is the string used for the title. We can't keep it as n\$ because it will be overwritten by the next use of the inpu procedure, which is next, to enter the filename.

```
480 PRINT AT 8,1;" "
490 PRINT AT 12,1;INK 4;"**
500 inpu 2,13,19 (SAM)
500 LET x=2: LET y=13: LET z=1
  9: LET r=510: GOTO 540: RE
```

```
M inpu (Spec)
510 LET fname$=n$ (SAM)
510 LET f$=n$ (Spec)
520 PRINT AT 12,1;" "
530 END PROC (SAM)
530 RETURN (Spec)
```

After we have set up the pie chart we need to input the data, so the next procedure we are going to input is called inputdata. Your computer already knows how many sectors are required (the variable sec). We are going to store the numbers in an array. An array is a way of storing numbers like in a table. You can imagine it as being a sheet of paper divided into rows and columns, with one number in each box. You treat each box like a separate variable. You can also have pages of these tables, and then books, then volumes (the libraries I suppose). If you don't understand yet, read on because it may get clearer.

Before we had a variable to store numbers, for example, z. The variable z could hold one number. So far, if we have several numbers, we had to use several variables. However, if you DEFINE the array, you can store more numbers in the same variable, for example:-

(Don't include this in your program)

```
10 DIM z(10)
```

This creates the ARRAY z, which can hold ten numbers. If you want to use the first of the numbers, you use z(1) like you would use any other variable. If you want to access the second number you use z(2), and so on.

If you imagine the above system as a list of numbers, you can also create a table of numbers, for example -

```
10 DIM z(5,10)
```

Creates an array, z, with 5 rows and 10 columns, holding 50 numbers. If you wanted to use the number in row 2, column 4 you can use z(2,4) like any other variable

You can add another dimension if you wish, ie DIM z(5,10,8). Note that when you DIM an array you also set all the values within to zero, so you must take care never to DIM an array which already exists and contains important numbers.

For our program I want to create an array which contains six numbers per sector. This array will contain all the information required to create the pie chart.

```
80 DEF PROC inputdata (SAM)
80 REM inputdata (Spec)
90 DIM n(sec,6)
```

So we have an array called n, and 6 entries for every sector. The first of those six numbers will hold the number that the user enters. We need to allow the user to enter these values, and change them if necessary. The user must also specify which of the sectors he/she wants 'off set' (see the BASICally Speaking sector in the example chart last month). Any number of sectors can be off set.

If we let the sector we are currently editing be m, we want to edit the value of sector 1 first:-

```
100 LET m=1
```

We will now loop round while we enter all the numbers.

```
110 DO (SAM only)
120 clr (SAM)
120 LET z=130: GOTO 700: REM c
  lr (Spec)
130 PLOT 0,130: DRAW 255,0 (SA
  M)
130 PLOT 0,130: DRAW 255,0 (Sp
  ec)
140 PRINT AT 1,1;"Sector numbe
  r: ;m;" of ";sec
150 PRINT AT 2,1;"Current valu
  e: ";n(m,1)
160 PRINT AT 3,1;"Off set : "+(
  "On" and n(m,2))+("Off" an
  d NOT n(m,2))
170 PRINT AT 5,1; INK 2;"Type
  in the new value"
180 PRINT AT 6,1;"and press RE
```

```
TURN."
190 PRINT AT 8,1;"Then/Or:"
200 PRINT AT 10,1;"Press + or
  - to edit the next"
210 PRINT AT 11,1;"or previous
  sector."
220 PRINT AT 15,1;"Press : who
  n finished all."
230 PRINT AT 13,1;"Press ; to
  toggle offset."
240 inpu 1,17,30 (SAM)
240 LET x=1: LET y=17: LET z=3
  0: LET r=250: GOTO 540: RE
  M inpu (Spec)
250 IF k$="" THEN LET m=m+1:
  IF m>sec: LET m=1: END IF:
  LOOP
260 IF k$="--" THEN LET m=m-1:
  IF m<1: LET m=sec: END IF:
  LOOP
270 IF k$<>" " AND k$<>" " AND
  n$(1)<>" " THEN LET n(m,1
  )=VAL n$
280 IF k$=":" THEN LET n(m,2)=
  NOT n(m,2)
290 LOOP UNTIL k$=":" (SAM)
290 IF k$<>" " THEN GOTO 120 (
  Spectrum)
300 clr (SAM)
300 LET z=310: GOTO 700: REM c
  lr (Spec)
310 PRINT AT 1,1,t$
320 END PROC (SAM)
330 RETURN (Spec)
```

The procedure prints the instructions to the screen and then uses inpu to take in information. The next five lines check k\$, which holds the last key pressed (n\$ holds the string entered). So if the user presses + then the program increases m by one (m is the sector number which is editing). Note that it checks if m is a number greater than the number of sectors (sec), and if so, it LETs m=1. Similarly for the - key, and if you attempt to press - when on the first sector it will take you up to the last (m=sec).

If either + or - have been pressed it will have looped, so now we needn't worry about those keys. If neither the : or the ; keys have been pressed we must be entering the value of the sector. We have

## BLUE ALPHA ELECTRONICS

We are pleased to be able to offer a full repair service to both Sam and Spectrum users. All our repairs carry a full 3 months guarantee against the same fault recurring.

### PRICES

Sam	£35
All Sam Interfaces	£20
Spectrum	£35
Plus D	£20

Please note that disc drive repairs are quoted for by us only after a *FREE* inspection - ring for details.

Other Items not listed - please phone with details of fault and in many cases we can give an instant quote.

All prices include UK return postage by *insured Carrier* - overseas customers please write for details of cost of postage and insurance. Please ring before sending items for repair.

**ALSO AVAILABLE** We can make and supply all types of cables - custom made to your specification. Just send us a Stamped Addressed Envelope with details of cable required (pin-outs, length, etc, and we will send you a quotation.

Send cheque/postal order (Pounds Sterling Only) payable to: Blue Alpha Electronics.

**Blue Alpha Electronics.** PLEASE NOTE NEW ADDRESS FROM .7/3/94  
Ynysforgan Farm, Morriston, Swansea, SA6 6QL. Tel: To Be Announced.

## ISOLATED & LONELY

Do you feel that you are the only Spectrum, QL, or SAM user in the world? Well, the SAM Spec Network Club will come to your rescue. We are setting up a register of users who, like you, would like to contact other users in your local area.

WE WILL PUT YOU IN TOUCH!

To find out more, simply send an S.A.E. to:

**SAM Spec  
Network Club**

1 Dovey Close, Astley, Tyldesley, Manchester, M29 7NP

a problem here folks. We have the number which we have entered in n\$, and the value needs to go in n(m,1), a numerical array. You must use the function VAL, which converts a string containing a number to a form which can be used like a number. The opposite function is the command STR\$, which converts a variable or numerical array into a form which can be used like any other string.

When ; is pressed, line 280 toggles the value in n(m,2) (remember m is the sector currently being edited) from one to zero, or vice versa. You should remember that NOT changes a true to false and a false to true, and that true is represented by one, false by zero.

The user should press : when all the values have been entered, and line 290 goes back for another input if it hasn't been pressed.

We have another problem. Suppose the user enters text instead of a number. Our procedure will try to VAL some letters, and the poor computer can't cope with that. It will give an error message. We need to prevent the user from entering letters and the easiest way to do that is within the input procedure. The input procedure needs to know when you are entering numbers (as above), or when you need to enter text (when it is used for the title for example).

```
550 LET u=(x=1 AND y=17)
```

This sets the variable u to true when the input bar is at the point specified. We will restrict numbers only when u is true. I have done this to demonstrate some BAD programming. Suppose you wanted to modify this program. You may need to use the input procedure. If you happened to place your input bar at the same place you would find that you could

only enter numbers, if you want to or not.

A better solution would be to LET u=1 before you run the input procedure for numbers, then let it equal zero again when it has finished. Can you see why?

When we want to enter text we want to allow all letters, numbers and symbols to be entered. These all lie between the ASCII codes 32 and 127 inclusive. We can test if k\$ is between these codes like we would test variables and numbers.

Delete lines 650 and 660 then enter:-

```
650 IF (NOT u AND (k$>CHR$ 31  
AND k$<CHR$ 122)) THEN LET  
n$(c)=k$: LET c=c+(c<>e)
```

The part which reads (k\$>CHR\$ 31 AND k\$<CHR\$ 122) is only true if the ASCII code for k\$ is between the 31 and 122 exclusive.

```
660 IF u AND ((k$>CHR$ 47 AND  
k$<CHR$ 57) OR k$="." ) THEN  
N LET n$(c)=k$: LET c=c+(c  
<>z)
```

This allows only numbers or the decimal point when u is true.

Also, if our inputdata procedure is to detect the +,;, and : keys then this procedure must finish when any of those keys are pressed. Change line 670 to:-

```
670 LOOP UNTIL k$=CHR$ 13 OR (  
u AND (k$="-" OR k$="+" OR  
k$=";" OR k$=";"))
```

Also, for neatness, we will PRINT the result without inverse before the procedure finishes.

```
680 PRINT AT y,x;n$
```

At line 690 you should have the END PROC or GOTO.

Next month we are going to manipulate the data inputted, and use it to draw the chart.

See ya'.

# SD Software



Quality Serious Software For Spectrum & Sam Coupé

## NEW - NEW THE FRACTAL COLLECTION NEW - NEW

A fast fractal generator for the ZX Spectrum. Now you can explore the fascinating world of fractals with this machine code program. Up to 200 shades on screen gives clear, crisp fractal pictures which can then be zoomed and expanded. Not just the Mandelbrot set but 18 different types can be made. Generates fractal music, you can hear the computer generate the fractal. Ready to use on disc for DISCIPLE/Plus D complete with ready-converted file for use with our SPECMAKER emulator on SAM

**SPECMAKER** The simplest Spectrum emulator on the market for SAM. 1000s of 48K programs work without the need for any conversion. Most other programs need only minor changes. All the extra SAM keys work in Spectrum mode. Uses SAM's parallel printer port and up to 360K of SAM's memory as a RAMDISC. Plus D, DISCIPLE and Opus discs\* can be loaded into SPECMAKER and saved to SAM disc. Can now convert files between Messenger and SPECMAKER format and to save on valuable disc space. Now comes with pre-converted Spectrum ROM image - no need to have a Spectrum available anymore. Supplied on 3 1/4" disc. \*Requires MasterDos and MasterBasic to use Opus single density discs

**PC-SUITE** From the same author as SPECMAKER. Now you can transfer your IBM data files by reading and writing IBM discs (720K format) on your SAM Coupé. PC-SUITE will even let you format IBM discs on your SAM. Write and edit SAM Basic programs on your PC. Use PC-SUITE to copy SAM data files to PC so you can print them on that high quality laser printer at work... nb. This is not a PC emulator

As used by Format Publications to transfer articles/programs for this mag.

**SPECFILE+** Now a Spectrum data filing program that never gets out of date. Specfiles holds a massive 28k of data and, by using compression makes it seem like much more. Free-format style means no complicated file design before you get started. Very fast CASE selective and complex searches. Designed to be extended - so it grows as you do. Works with PLUS D, DISCIPLE or under SpecMaker on SAM. This program is a must for anyone with data to store. *Special +3 version also available on 3" - add £2 to price shown below.*

**UNIDOS** version 2 of the incredible new DOS from Steve Watt for the PLUS D and DISCIPLE. Same DOS system file for BOTH interfaces. Random Access Files; Sub Directories, Hundreds of files on one disc, Hidden files; Protected files; Copy files of ANY length; incredibly versatile Screen Dump routines; Error Trapping and MANY more features. Compatible with all Spectrums (+2a/+3 in 48K mode). Over 20 programs now included on the tape. State DISCIPLE or PLUS D on order

PRICES:	Non Members	INDUG Members	Spectrum Owners
The Fractal Collection	£5.95	£4.95	Don't forget to say if ordering for PLUS D or DISCIPLE and state disc size - 3 1/4" or 5 1/4" (80 track only).
Specfile+	£12.95	£9.95	<b>INDUG MEMBERS</b>
UNIDOS	£25.95	£19.95	Don't forget your membership number if claiming discount
Createfile Manual	£8.50	£5.50	
SpecMaker	£12.95	£9.95	
PC Suite	£25.95	£19.95	
IBU* / SAM IBU	£4.90	£3.50	
File Converter*	£5.30	£4.00	
Hacker's Workbench*	£9.90	£8.50	

\* DOS programs still available

Please add £0.50 postage (£1.20 outside UK)

# Uni-Dos Corner

By:- Henk van Leeuwen. Edited by:- Adrian Russell.

UNI-DOS is the advanced ROM/DOS system for both the DISCIPLE and PLUS D marketed by S.D. Software. This series of articles helps you to write CREATE files - a means of adding new commands and functions to UNI-DOS which can be used in your own Basic

The CREATE files, when loaded, are stored in the Basic memory space and they must be written to be relocateable.

When you have a big Basic program and you may want to SAVE just a few lines of it to disc. The new commands we build this month will allow you to do just that. Here is the syntax:-

```
EXP <OVER> <start> TO <end> ;D<d
rive>"Name....."
```

OR

```
EXP <OVER> <start> TO <end> ;D<d
rive>,a$
```

I think the commands speak for themselves but there are some comments in the listing below. I use EXP as the keyword to stand for EXPORT - because we are exporting lines that can then be used elsewhere.

Here is the assembler listing:-

```
ORG 60000
START DEFB 1 ;only one syntax
      DEFB 185 ;SAVE keyword
      DEFW EXP_LEN
L_EXP RST 24
      DEFB 115 ;OVER.SYN
      RST 16
      DEFW 7298
;ask for startline number
```

```
CP 204 ;Token for 'TO'
RST NZ
RST 40
RST 16
DEFW 7298
;ask for last line number
CP ";", ;test for ','
RST 40
AND 223 ;capitals
CP "D" ;use D for drive
;if wrong reject syntax
RST 40 ;end of syntax
RST 24 ;get drive number
DEFB 120 ;DR.NUM
RST 24 ;next char " or ,
DEFB 112 ;SEPARATOR
RST NZ ;if wrong reject
RST 24 ;get the filename
DEFB 123 ;GET.NAME
RST 24 ;end of part one
DEFB 13 ;SYN.END
RST 24
DEFB 111 ;check.drive
RST 16
DEFW 7833
;get last line number
LD H,B ;replace BC to HL
LD L,C
RST 16
DEFW 6510
;go to Spectrum ROM and get
;address of line number
JR NZ,ERROR
;addr found so continue
LD (15893),HL
;replace line address
INC HL
INC HL
LD C,(HL)
;now point to first byte of
;the length & copy to C register
INC HL
LD B,(HL) ;copy to B
LD A,B
OR C
JR NZ,CONT.1
;if both zero then line number
```



```

;not in Basic
ERROR RST 32
      DEFB 141
;issue parameter error message.
CONT_1 INC BC
      INC BC
;also use bytes for line number
;and length line
      INC BC
      INC BC
      LD (15889),BC
;last line length
      RST 16
      DEFW 7833
;get start line
      LD H,B
      LD L,C ;copy BC to HL
      RST 16
      DEFW 6510
;go to spectrum ROM and get
;address of line number
      JR NZ,ERROR
;address found so continue
      LD (15891),HL
;start address to save
      LD HL,(15893)
      LD BC,(15891)
      SBC HL,BC
      LD BC,(15889)
      ADD HL,BC
      LD (15889),HL ;DRAM HD0B
      LD (15893),HL ;DRAM HD0F
      LD A,1 ;directory type
      LD (15877),A
      LD A,"D" ;device type
      LD (15876),A
      LD A,0 ;file type
      LD (15888),A
      RST 24 ;Opens write file
      DEFB 61 ;OPEN.FILE
      RST 24
;save a 9 byte block as header
      DEFB 44 ;SAVE.HEAD
      LD HL,(15891)
;get start address into HL
      LD DE,(15889)
;get length into DE
      LD (15274),DE
      RST 24
      DEFB 39 ;SAVE.BLOCK
;save a block of DE bytes
      RST 24
      DEFB 66 ;CLOSE.FILE
      RST 24 ;end of part two
      DEFB 14 ;COM.END
EXP_LEN EQU $-L_EXP

```

Right, here are the DATA lines to enter in a Basic data-poker program if you don't have your own assembler

```

40 DATA 1,185,135,0,223,115,21
5,130
41 DATA 28,254,204,192,239,215,
130,28
42 DATA 254,59,192,239,230,223,
254,68
43 DATA 192,239,223,120,223,112
,192,223
44 DATA 123,223,13,223,111,215,
153,30
45 DATA 96,105,215,110,25,32,12
,34
46 DATA 21,62,35,35,78,35,70,12
0
47 DATA 177,32,2,231,141,3,3,3
48 DATA 3,237,67,17,62,215,153,
30
49 DATA 96,105,215,110,25,32,23
6,34
50 DATA 19,62,42,21,62,237,75,1
9
51 DATA 62,237,66,237,75,17,62,
9
52 DATA 34,17,62,34,21,62,62,1
53 DATA 50,5,62,62,68,50,4,62
54 DATA 62,0,50,16,62,223,61,19
2
55 DATA 223,44,42,19,62,237,91,
17
56 DATA 62,237,83,170,59,223,39
,223
57 DATA 66,223,14

```

Once you have assembled the code (or poked it in) then save it as:-

```
SAVE d*"EXPlncode"USR 60000,139
```

If you want to know more about CREATE files then there is an excellent booklet published by S.D.Software that explains all the basics. Although it is not essential, it would be very useful if you had it to hand as you worked through the listings we publish.

Next time here in UNI-DOS Corner we will present a similar routine that will allow you to save just the variables from a Basic program.

See you soon.

# The HELP PAGE

Edited By:- Ray Bray.

The first letter this month comes from Bernadette Downsland who has recently purchased a Spectrum +3 and is having problems using a printer connected via the parallel printer port. It would seem that the +3 in question is fitted with one of the earlier ROMs which, when printing, can cause extra line feeds, erratic alignment of the left hand margin and duplication of some characters. Fortunately these problems can all be rectified by entering two commands before loading programs which produce printed output; namely POKE 23354,42 and POKE 23355,16. To make these commands work correctly in a program line it may be necessary to add a third command, POKE 23390,20. Mike mentions that he has to use these POKEs before he can LLIST or LPRINT but the versions of TASWORD +3 and MASTERFILE which he has do not require any alteration.

Ron Deeks of Hove uses his SAM fitted with SAMBUS only at weekends and is dismayed to find that each time he switches the computer on he has to reset the time and date. He feels that his use over the weekend should be sufficient to keep the battery charged and concludes that, either the battery is not doing its job or that the clock is being corrupted during power up. He wonders whether fitting the external power supply for the SAMBUS would keep the clock running. I don't have any figures for how much computer use is needed to keep the

battery charged up, but as you say you use it for many hours each weekend, I wouldn't think that is the cause of your problem. It is possible that you have a faulty battery or the battery connections are faulty and, if possible, you should check for this before looking for more serious faults. The external power supply for SAMBUS only supplies power to any peripheral equipment attached to the SAMBUS, therefore it would not help in keeping the battery charged while the computer is switched off. Ron also wishes to know if the TWOUF connector has a clock. The answer is to this is no.

Stephen Cox is having difficulty getting a stable display from his 512K SAM using the SCART socket despite using two different SCART leads (one from *FORMAT*), and trying two different TVs and a monitor. He concludes therefore that there must be a fault with his computer and wonders if there is some way that he can 'tune' it to produce a stable display. Unfortunately not all TVs and monitors use a standard pin layout for the SCART socket and you might have been unlucky in trying three equipments which do not follow the layout used for the SAM lead. The main problem is usually caused by the CSYNC and CVIDIN pins which are inter-connected on the lead. If one or both of these are in a different position on the TV or monitor then the picture will not stabilize. You say that you borrowed one SCART lead. If this was

being used for running a SAM then you could check your SAM on the lender's TV/monitor. There is no tuning which you can carry out on the SAM video output without the proper test equipment.

Another question concerning displays comes from R.Barton of Rotherham. He has a Sanyo colour data display which has 8 wires coming from a socket at the back. He knows that the black wire is earth, the red green and blue are the screen colour connections, and the brown is the composite sync. He wishes to know what the other three wires (white, yellow and grey) are for. I don't have any details of this display but looking at the various connections on other equipments I would think that they are either CSYNGND, CVID and CVIDGND or, REDGND BLUEGND and GREENGND. I couldn't guess which wires would be allocated to these functions. Incidentally CVID does not include audio as your letter implies. Another display he owns requires horizontal and vertical sync inputs instead of a composite sync input. He says he has connected the 'comp and the vert' from a Spectrum +2 but cannot stop the display from rolling. Unfortunately, pin 5 which you ascribe to VSYNC is in fact listed in the handbook as being +12V not VSYNC which, even if the display is accepting the horizontal component of CSYNC, is why the picture is rolling. The answer to your supplementary question on whether it is possible to convert CSYNC to HSYNC and VSYNC and CVID to RGB must be yes, as there are microchips which do this in TVs. However, unless you are an expert in electronics I doubt if it is a feasible proposition as the chips require a lot of additional components to match the video circuitry. Having said that there is

bound to be a reader who has found a simple way of doing this!

Printers continue to cause a lot of problems for our readers. John Moore has a fault which I haven't come across before. He runs a Citizen 120D printer with his SAM and although he can print to continuous feed paper, every time he tries to LPRINT to single sheets the paper out light comes on and the SAM crashes. One thing which puzzles me is that the paper out detector seems to be working properly with fan-fold paper so the mechanical detector must be working. However, I am not familiar with the Citizen 120 printer and perhaps it has a switch to select tractor feed which causes the light to be isolated. Most printers have paper out detector isolating switches which can be used to bypass this problem, failing this the appropriate printer control command could be used to do the same thing. However, if as John says the SAM crashes rather than just hanging-up, this seems to indicate something else is wrong, but I can't think of anything which would cause this to happen with single sheets but not with fan-fold paper. Has any other reader experienced a similar problem with the citizen printer?

Finally, we have a couple of responses to previous questions we couldn't answer. Gary Rowland had a problem with finding a replacement +3 disc drive last October. He has now written saying that he has found a supplier of a suitable drive which was originally intended for the CPC computer (Part No.EME 157). Installation is simply a matter of unplugging the old drive, transferring the mounting bracket to the new drive and plugging it in. The drives, which have a different colour fascia, cost 25 + 5 p&p and can be obtained from Hobbykit

Ltd, Unit 19, Capital Industrial Park, Capital Way, London, NW9 0EQ. Tel:(081) 2057485

The second item is a really rapid response from Cliff Jackson to John Foster's query in last month's issue of *FORMAT* about where to obtain a Y connector to allow additional peripherals to be fitted to the +2. Cliff says that GREENWELD ELECTRONICS LTD. are offering a skeleton version of the old CURRAH SLOT for the bargain price of £1 + p&p in their latest Bargain List N°102. Greenweld can be contacted on 0703 238363 and their address is 27 Park Road, Freemantle, Southampton.

Thanks to Gary and Cliff for that information, I'm sure that several readers will be pleased hear of these suppliers.

Well that's all for this month. I realise that the evenings are rapidly drawing out now and that many of you will have less time to spend at the keyboard, but we will still be here to try an answer your questions and pass on any answers you may have, so please send your questions/answers to the following addresses:-

Anything SAM or General Purpose (and for now, anything Spectrum):-

Ray Bray (Format Help Page),  
'Elmsle:gh',

4, Tidworth Road,  
Porton,  
Salisbury,  
Wiltshire, SP4 0NG

Anything +3, CPM:-

Mike Atkins (Format Help Page),  
70, Rudgwick Drive,  
Bury,  
Lancashire, BL8 1YE.

## SMALL ADS

**URGENTLY WANTED:** The ZXclub Budapest needs the LASER GENIUS by Oasis Software for 128K Spectrum. Phone or Fax to Istvan Ordog 36 1 25 25 026 or write to: H 1148 Budapest, Vezér ut 143, Hungary. We would pay full price.

**MESSENGER** for sale. Hardly used, £20. Ring 0732 780608 (preferably evenings) or write to Mrs E.Jerrard, 27 Roman Court, Fairfield Road, Borough Green, Kent, TN15 8NY

**SPECTRUM GAMES** (including +3 disc games) and magazines. Send SAE for list to A.P.Cresswell, 18 West Street, Geddington, Northants, NN14 1BD

**WANTED** Cable to connect 8056 serial printer to QL or Spectrum+2. Please phone Joe on 0449 676193.

**BARGAIN GALORE!** Original Spectrum tape software for sale. Prices start from as little as 50p. Over 100 titles available. For full list send SAE to K.H.Tang, 194 Central Road, Coalville, Leicester, LE67 2FG

**FOR SALE:** SAM 512K, 2 disc drives (1 external), Sombus, Mouse, Citizen 120D printer, lots of software including Driver, Gamesmaster, MasterDOS/Basic, SC\_Assembler, some games, all manuals, £300 o.n.o. Tel: 0750 20176.

**BROTHER HRS** printer with mains adaptor and two ribbons. £25. Phone David Field on 0452 411237

**WANTED.** Multiface 1 or 128, Videoface and instructions complete for original Microdrive kit. Must be cheap and F.W.O. Phone David on 0638 702723 (7 to 9pm except Mondays).

**WANTED** Spectrum+2 Machine Language For The Absolute Beginner (Melbourne) Pay £15 + carriage costs. Phone David on 0656 880550.

### YOUR ADVERTS

Selling, Buying, Post Friends, etc.  
Any PRIVATE advert, subject to acceptance, will be printed FREE in the next available issue. Any software sold MUST be original. The publishers will not be held, in any way, responsible for the adverts in this column.  
Due to shortage of space, if your advert remains unpublished after two months then please send it in again.  
Trade advertisers contact the publisher for rates.

# NEW SC\_WORD pro

Coming soon, **SC\_WORD pro** the most unique professional word-processor for the Sam. Sam word-processors are the same in one respect when you come to print out your document letter, you are restricted to the size and number of Fonts your software and printer uses.

**SC\_WORD pro** is different, it doesn't use LPRINT text, but uses it's own built in bit image fonts, like the ones you are reading now which are smooth and non jagged the same quality you would get from Amiga and PC Computers, even large fonts which go up to 14mm high don't have blocky jagged bits like lprint characters do.

There is a large easy to use 128K word-processor area to edit your text, you can load in text from other sam word-processors.

Text can be outputted to 24 or 48 pin printers to any size of paper just where you want it, in a variety of sizes and proportional fonts, there is no need to fiddle with control codes etc, everything is handled automatically, ideal for those who have limited knowledge of printers.

Text can be surrounded in various borders and paper colour inside a box like the one below.

See the prototype or the finished version at a special launch price at the **GLOUCESTER FORMAT show APRIL**. All other **SC\_Software** reduced in price at the show.

## WHAT'S IN THE PACKAGE

**SC\_ASSEMBLER £12.50** Machine code editor  
Type in machine code programs with the easy to use automatic outloko editor, type in listings from this magazine, or your own. Highly recommended by Carol Brooksbank.

**SC\_MONITOR pro £15.00** Debug Machine code  
SC\_Monitor and TurboMON two very powerful utilities allowing you to slow run machine code programs, seeing what effect it has on registers, flags, etc. Comes with Disassembler.

**SC\_AUTOBOOT £15.00** Replacement Rom  
When you turn on the coupe there is no wait or pressing of the F9 key, instead you now have instant reset and automatic Boot up. Features powerful break button.

**SC\_DISC PROTECTOR £15.00** Interface to solder  
No more disc corruption when turning the power on to the Sam or pressing the reset button. Unit has 3 colour coded wires to solder Sam's circuit board.

**FOR MORE INFORMATION**, see November's issue of Format. OR for a detailed Catalogue, Demos & Screenshots, and other products send a blank Formatted disc and three 2nd class stamps to cover cost.

**SC\_FILER £12.50** Powerful user defined database  
Set up the database to your exact requirements with fields of any size, position, colour, chosen on a mode 3 screen. 99% machine code, massive storage.

**SC\_PD3 £2.50** Public Domain software  
SC\_Speclone (Spectrum Emulator), Two Screens/Code compressors, SC\_Discione (clone disc copier), plus a disc Directory utility, unerase, rename, sort files etc.

**SC\_24 PIN DUMPER £2.50** Screen dumper  
If you have a 24 pin printer, this utility will dump hi-res Mode 4, 16 grey shade screens to the printer, at any position on the paper, enhanced 48 pin dumps for Canon Printers.

**SC\_DTP £25.00** (Need Masterdos, £12 for a copy)  
Desk Top Publisher, organises text and graphics to produce professional Newsletters, Manuals etc. Comes with built in word-processor, output to 9 and enhanced 24 pin printers.

**BUY NOW PAY LATER** A very popular way to pay for software, just phone the below number and quote the items you would like to order, software sent out first thing next morning with Invoice, have up to 1 month to pay.

**PRINTERS** Others phone  
Canon bubblejet BJ10ax £195  
BJ200 £265. BJC600 £505

## STEVES SOFTWARE

7 NARROW CLOSE, HISTON, CAMBRIDGE, CB4 4XX  
TEL 0223 235150 From 6pm-9pm MON-SAT



# YOUR LETTERS

Dear Editor,

In the last paragraph of Dr E.J. Wilson's letter in *FORMAT* Mar '94, he asks "is there a better way?" (of using his trick for printing £): yes there is; use the same trick as I used for printing a crossed-out equals in my Jan 94 article on redefining the keyboard in *The Secretary*.

He does not say which 'orator' he changes; I assume it is the Lower one, whose 'k-code' (see my article) is 254 (orator caps is 253); so we want to assign this to the key [symbol]L, whose map-position is 196 (SAM User Guide, Appendix, last page). This is done by changing the file "Key\_Dkeys" as in the first piece of program in my article with the 2nd line:- **POKE 22752+196,254**

Using the normal key for £ will then send to the printer the code entered in 'orator lower'.

It is also preferable to have £ appearing on the screen, not the symbol indicating 'orator lower': so we change file "Sec\_chr2" as described in my article, the essential statement being :-

**POKE 38648+8\*254,12,18,16,56,16,16,62,0**

The suggested code to be entered in 'orator lower' will produce a £ sign, as required, but will also, I think, have the effect that, once a £ is so produced, key [SHIFT]3 will produce £ on the printer, not #; so the USA International Character Set should be restored,

making "27,82,3,35,27,82,0" as the code to be put in 'orator lower'; can be done using *The Secretary's* facilities, but see my article for a less laborious way.

Yours sincerely, *Ettrick Thomson*.

Thank you for the excellent work on *The Secretary* Ettrick, I'm sure many will profit from your efforts. **Bob**.

Dear Editor,

SAM Coupé Public Domain Software Library. At long last, a new Public Domain software library for the SAM Coupé. We aim to provide a reliable PD software supply for all SAM owners. There's no need to call us the 'SCPDSL' or anything like that, just plain and simple SAM PD.

There are NO subscription or membership charges, no clubs or any obligations just, what we hope to be, a reliable software service for SAM users.

We do, however, and always will need new titles for our Library and we will gratefully accept all contributions. Single programs, demos, compilation discs, disc magazines, music modules, Basic, machine code, screen\$, in fact we welcome any software, be it PD or Shareware.

From a contributors point of view, donating your work to a PD Library can be a very rewarding experience. You can gain recognition and receive all the encouragement that you need to further your programming experiments. We aren't expecting professional standards



(though chance might be a fine thing!), but we will look at ANYTHING that you send. We will return your disc(s) on request.

To kick-start our PD Library, Steve Taylor, the author of that superb WIMP environment program for SAM - DRIVER, and those excellent machine code articles in FRED magazine, has given us THE MOUSE DRIVER V2.0 - Only £1.50 from SAM PD!

MOUSE DRIVER 2.0, is a utility that we can recommend to each and every SAM user. It is a stand alone version of the mouse pointer routine, as used in DRIVER. All the user need do to use it in his own programs is load in the code, POKE a System Variable and any one of SEVEN different pointers are at your disposal (EIGHT if you include the user definable pointer option!).

XMOUSE, YMOUSE, BUTTON(s) 1 and 3 are all supported. This is, perhaps, the most important PD utility to hit the SAM scene since the (SAMCO) mouse was made available. The program code sits in a Utility page, and like the DUMP utility, MasterDOS/BASIC etc. it will survive NEW, LOAD etc. and is fully interrupt driven. The program is fully documented in a READ ME file on the disc and we can supply printouts on request. Many thanks to Steve Taylor.

Shareware is a concept that is popular on other machines and we would like to encourage this practice for the SAM. The main idea is to help programmer's who may be developing utility software, or even games and also to help people who would like to 'try before you buy'. To meet some of their development costs, time spent programming etc. a programmer can place a freely distributable and unregistered version of their software into the public domain.

The idea is that if the user finds that he likes a particular piece of shareware, and if he thinks that the software will be useful, then he can register his interest and pay the programmer a fee (one that is usually requested within the documentation for the program) and thus the programmer will receive a reward for his work. The benefits for the user are that: 1, your conscience will be clear if you like and intend to use the program, and 2, the programmer may send you an enhanced version or updates of the work.

Some programmers release shareware versions of programs, with certain features disabled. This is a good way of 'advertising' the software in the form of a partly working demo. On payment of the shareware fee, the user will then receive a fully working version.

We at Sam PD are also catering for overseas Sam users. If you find that because of the low price of PD software and the added cost of a Euro cheque, it works out expensive to obtain PD software. The next time you order *FORMAT* or any other Sam product for that matter, be it hardware or software, then send the whole cheque to us at Sam PD. We will then split your cheque and send you your PD software and pass your cheque and order onto the other distributor for their attention.

For the full SAM PD list, please send a large stamped self addressed envelope to:- Derek Morgan, 18 Mill Lane, Glenburn Road, Old Skelmersdale, Lancashire, WN8 8RH

*Yours sincerely, Derek Morgan.*

**Dear Editor,**

An Adventure Probe reader has drawn my attention to the fact that a few people may not be aware that 'The Guild Adventure Software', as run by Tony

Collins, has ceased trading, and are therefore still including The Guild in their list of contacts.

I informed my readers that The Guild had ceased trading in the August 1993 magazine (distributed 11th September 1993) and that the Commodore catalogue had already been passed to Binary Zone PD (to the surprise of the authors of the adventures as they hadn't been advised of the change), and that he intended to drop the Spectrum titles.

Since the beginning of September 1993 no one, to my knowledge, has been able to contact Tony Collins. Authors of the adventures he sold haven't received any royalties from him, and many customers haven't received a reply to their long-outstanding orders for software.

More recently some have reported that letters and cheques have been returned by the post office marked "moved house - no forwarding address given". To make matters worse, the glossy magazines, who work 2 to 3 months in advance, continued to run special offers for The Guild software.

I contacted a few authors with the view to publishing some of the titles to ensure they remained available to players, but soon realized I couldn't offer a full service as I wasn't able to provide the titles on disc. Since then I have been in close association with Phil Reynolds of The Adventure Workshop and it has been agreed that he will publish the titles, as he can offer both disc and tape, while I will only offer (on tape) the adventures by authors who have donated the proceeds to Adventure Probe. All titles have been thoroughly checked, any bugs eliminated, and the presentation improved.

I hope this information will help to clear up some of the confusion that has

arisen due to the sudden departure of Tony Collins and The Guild.

*Yours sincerely, Barbara Gibb.*

Anyone wishing to contact Barbara can do so by writing to 52 Burford Road, Liverpool, L16 6AQ. *Ed.*

**Dear Editor,**

May I take this opportunity to say that as a SAM owning, middle aged illiterate, with game playing sons, I find *FORMAT* a great help. However, I wish you would review games. I've bought loads of games in a one man attempt to save the SAM and would have welcomed objective reviews. I would also like unbiased guidance on instantly compatible printers re:- price, print quality, running costs etc.,

*Yours sincerely, J.Wright.*

Games reviews are the one thing we have always kept clear of in *FORMAT*. This stance came about because when *FORMAT* was launched there were 5 or 6 glossy mags all printing reviews of Spectrum games. Now things are different. *FORMAT* is the only large circulation printed magazine left with any interest in the Spectrum and SAM market. If I even mention games in these pages some readers go into apoplexy but what do readers in general think, let me know. *Ed.*

**Dear Editor,**

I was delighted to see from the current *FORMAT* that you are re-marketing the Cardex/PCG DTP suite, although I must say that I think that you have pitched the price a bit high.

*Wordmaster*, in my view, is infinitely superior to *Tasword* and its derivatives, and I made several desultory attempts to contact PCG to try to persuade them to

put it back on the market. You have obviously been more successful, or more persistent, than I.

I am spending more and more time with my PC these days, and I am seriously considering buying the Spectrum version of *Wordmaster* (I have only got the SAM version) to run under Lunter's emulator (but only in 48K mode!!!)

As my computing horizons have expanded over the years, I have acquired better, or at least newer, hardware and software. But because of my inherently squirrel-like nature, I have been unable to throw the earlier things away, in case I ever needed to come back to them.

But I have now reached an age when, if I am honest with myself, I can virtually guarantee that I will never have the time or the interest to return to the ZX81, and having recently acquired a PC-compatible I suspect that the time I devote to the Spectrum will, before long, reduce drastically.

My problem is what to do with this ageing hardware and software. I feel the need to dispose of it, since I could use the cupboard and bookshelf space that it occupies for other things, but I am reluctant to throw anything like this away until I am certain that it is of no interest to anyone.

Now clearly I could advertise all the items for sale via MicroMart, or the small ads column in *FORMAT*, but since I am not really looking to convert the items into cash this may not be the best way to go.

Inspired to some extent by recent comments in PCW and Computer Shopper, I wondered whether there was any way in which you, and/or *FORMAT*, could set up a pool of old Sinclair and SAM hardware and software that could

be sold to interested parties for reasonable sums, the proceeds being contributed to a suitable charity or group of charities - obviously if *FORMAT* staff were involved, then suitable handling charges would be appropriate.

If there was any mileage in this idea, I could contribute original copies of *Tasword 2* and *Outlet v2.0* for SAM, (both with manuals), a cassette version of *The Last Word* plus manual for a 48k Spectrum, copies of the Spectrum introductory, BASIC and IP1/Microdrive manuals, a VTX5000 modem and two rubber-key 48k Spectrums. If you thought it worthwhile reaching back into history, I also have one and a half ZX81s plus documentation and some programs. In addition there are many Spectrum books sitting on my bookshelves.

What do you, and your readers, think about this idea - and would they support it themselves? If not, then any other suggestion would be welcome - one thought being to donate to a suitable childrens home, which would need to have access to a Spectrum expert to get things up and running.

I have recently dropped my SAM power pack on the floor and broken the top cover - are there any spare covers available.

*Yours sincerely, Alan D.Cox.*

We have handled charity items before but it is a real bind to try to do anything by mail-order. However, as we have the Gloucester Show at the end of April (with another later in the year I hope) we could set up a charity stand if we got enough donations. Anyone interested should send items, clearly marked as being for charity sale, and clearly marked working or not working. I don't know if there is time for the April show

but let's see what comes in.

SAM power supply cases are still available - see some of the FRS pages from a few months back.

As to the PCG DTP pack being over priced. With a saving of over £23 I thought it was excellent value for money.  
**Ed.**

**Dear Editor,**

First of all, I would like to say that I look forward to receiving *FORMAT* each month. Looking back through the back copies as I do while waiting for the latest copy, I noticed a series of articles that I forgot to mention in your questionnaire. The series 'Hardware Design Course' I enjoyed particularly, as it encourages one to explore the possibilities of the SAM even further. I would just like to ask: have we seen the last of these articles, or do you intend to publish further parts to this series? If not, can I obtain these articles anywhere else? Also, in part one the author talks about 'a series of inexpensive kits will also be available as the series progresses'. Are any of these kits still available, indeed is it possible to obtain the Hardware Development Kit that was released prior to Samco's demise? If you could help me with any information I would be most grateful. Another question (sorry): Do you know of any of the following:- 1) When will the Video Digitizer be ready for release. 2) The address of a PD library for the SAM? 3) Was the rumour of a program to load AMIGA screens into the SAM just a rumour, or does such a program exist, and from whom? 4) Has my renewal reached you? because as at time of writing, I haven't received the February copy.

Many thanks for your attention.

*Yours sincerely, J.W.Canfield.*

Adrian Parker is having trouble finding the time to write the hardware article but he has promised me a couple of months worth very soon. See last months editorial about the hardware kits.

1) Sometime, but don't hold your breath. 2) See earlier in letters section. 3) There are a few routines floating around but nothing commercial. **Ed.**

And 4) Yes, it was in our 'hold-back' file because it didn't have a membership number on, but now I have it because its at the top of your letter! **Jenny.**

**Dear Editor,**

Enclosed is a cheque because I think my subscriptions are about due. How can you tell? Fred Mag has a number on the envelope with your membership number.

I wonder if you could help me, is there any software on the market that could emulate the 128K Spectrum and the Amiga computers. As a workmate with his emulator on his Amiga will emulate some of my SAM Discs.

Thank you for any info and keep up the good work and keep the Spectrum alive.

*Yours sincerely B.Tillotson.*

We have covered your first question many times in the past but, at the risk of boring some readers, I'll tell you again. The top line of the label used to send out *FORMAT* each month contains the following: 5 digit membership number, space, 4 digit expiry date, space, our sort code. The expiry date is the month your membership runs out so, for example, if the code was 0794 this would mean that you expire at the end of July this year and therefore the August 1994 issue would be the last you get. But renewal notices are sent out with the last two issues so there is no danger of you

missing issues.

As to your second question, I must admit I don't quite understand what you are saying. Perhaps you could write again putting the question a little clearer. *Ed.*

**Dear Editor,**

In response to Mark Sturdy's letter, I wonder if he and Geoff Winkless are aware of the hardware add-ons that David Ledbury is hoping to bring out on the SAM. The first of these should be the SAM VOX II (SAM VOX I didn't work!), which would give the Coupé a sampler chip and 4 analogue-to-digital channels to enable it to play instrument voices. He also wants to use the proceeds to create a graphics enhancement board, which would give full screen scrolling and hardware sprites (whatever they are), a 20 MHz accelerator chip and a hard drive.

I'm not sure what stage of development these things are at, but I have written to Dave telling him that I want to see them appear on the SAM, and I'd urge all *FORMAT* readers to do the same. He may not persevere unless he knows he has the support of the people.

I got all this information from a mailshot that was sent out to all SAM Coupé Adventure Club members. I wanted to pass it on to a wider readership, though I don't know if David has contacted you himself.

*Yours sincerely, Nick Xylas.*

Now I don't want to be a pessimist Nick, but I doubt very much that these products will ever come off. A hard drive is possible, it has been done on the Spectrum before, but it would require a DOS and that would take a long time and much money to produce.

An accelerator chip or new graphics

board are again possible, but the market would be small and therefore the cost very high.

Any readers like to join in the debate?  
*Ed.*

**Dear Editor,**

I have for some time wondered whether to ditch SAM in favour of an MS-DOS PC, due to the lack of software etc., but recent improvements have persuaded me to stick with SAM.

I therefore recently bought a second-hand twin-drive SAM (advertised in *FORMAT*) as back-up to my original SAM and placed several orders for the mouse, utilities and other software like Lemmings, Legend of Eshan and Sampaint.

I have bought the games mainly on the strength of Bob's endorsement, knowing his normal lack of interest in these things and Sampaint on Carol's recommendation.

Anyway, knowing how important the membership number is to you and the problems it causes when it is not provided or is wrong, it really is ironic that the order to you was the only one with the wrong number.

The correct number is given above and I apologize for the error.

Thanks for the March issue of *FORMAT* and for all your hard graft on our behalf.

I can now start to explore Lemmings and Sampaint using my new mouse and look forward to receiving the rest of my order.

*Yours sincerely, Maurice J. Smith.*

Letters may be shortened or edited to fit on these pages.

Please keep your letters short so we can fit in as many as possible each month.

## SOFTWARE

### SAM Coupé Software On 3 1/2" Disc

**PCG's DTP PACK.** The famous package including WordMaster, TypeLiner, HeadLiner. Complete on disc for SAM. R.R.P. £37.50. **SPECIAL READER'S BONUS** - Now includes 2 extra font packs worth £15.90 bringing the total pack value to £53.40.

Order Code: SCD-04 Price: £34.95

**COLOUR DUMP.** Screen dump software to work with Epson compatible colour printers. RRP £10.

Order Code: SCD-05 Price: £8.95

### SAMSPEC SOFTWARE

SAM + Spectrum versions on one disc  
(80 track 3 1/2" or 5 1/4" - please state on order)

**FONT LIBRARY.** 100 screen fonts plus support software, easy to use on either computer. Special +3 disc available (Spectrum files only). RRP £8.95

Order Code: SSD-01 Price: £6.95

**MONEY MANAGER.** Advanced personal budgeting system for both machines. Spectrum version needs 128K/+2 (not +2a or +3). RRP £15.95

Order Code: SSD-02 Price: £12.95

### SPECTRUM SOFTWARE

Unless otherwise indicated these are DISCIPLINE/PLUS D programs. Please state 3 1/2" or 5 1/4" disc (80 track only) on order.

**ARTIST 2.** The best art package ever written for the Spectrum. 48K and 128K versions on the same disc. With page-maker and utility software. Full manual. RRP £19.95

Order Code: SPD-01 Price: £16.95

**UTILITY DISC #1.** Six of the best and most useful disc utilities for DISCIPLINE or PLUS D. Added bonus program - not to be missed. RRP £9.95

Order Code: SPD-02 Price: £6.95

**PCG's DTP PACK.** The famous package including WordMaster, TypeLiner, HeadLiner. R.R.P. £37.50. **SPECIAL READER'S BONUS** - Now includes 2 extra font packs worth £15.90 bringing the total pack value to £53.40.

Order Code: SPD-04 Price: £34.95

Special 3" disc version for +3

Order Code: SPD-04C Price: £36.95

## HARDWARE

**SPI-SAM's Printer Interface.** A full feature parallel (Centronics) printer interface. Totally compatible with SAM's ROM and DOS printing routines and with utility programs like FLASH, Word-processors, etc. Uses standard BBC type lead (see below). RRP £24.95

Order Code: SPI Price: £19.95

>>>>

# FORMAT

## READERS SERVICES

**PRINTER LEAD.** Top quality parallel printer lead (BBC standard). 2 meters long. For use with DISCIPLINE, PLUS D or SAM. RRP £10.95

Order Code: PPL-01 Price: £7.95

### SAM COUPÉ TECHNICAL MANUAL Version 3.

The real inside info on SAM. As published by MGT/SAMCO. No SAM is complete without one. Now only available through us. RRP £16.95

Order Code: STM-01 Price: £12.95

**MOUSE MAT & HOLDER.** Top quality mouse mat (not to be confused with the small cheap ones) together with a handy mouse holder to keep your mouse out of harms way when not in use. Holder fits to any smooth surface with sticky pads provided. RRP £8.98

Order Code: SMM-01 Price: £5.95

## FORMAT BACK-ISSUES

Volumes 1,2,3 and 4 of *FORMAT* are now available only as complete volumes.

Order Code: FBI-V1 (Vol.1) Price: £10.00

Order Code: FBI-V2 (Vol.2) Price: £12.00

Order Code: FBI-V3 (Vol.3) Price: £12.00

Order Code: FBI-V4 (Vol.4) Price: £12.00

All issues, from Volume 5 No 1 to the latest issue, are still available separately. To order just quote the Volume/Issue No. Price: £1.50 each, (5 or more £1.25 per copy).

## FORMAT BINDERS

Hardcover binders to protect your valuable magazines. Each will hold 12 copies of *FORMAT* (or any other A5 magazine or manual). Copies held in place by wires that just spring out for easy insertion or removal.

Order Code: FMB-01 Price: £4.50

**ORDERING** All prices include UK p&p, overseas readers please add 10% to total order for extra postage.

Clearly state Order Code, Product description, Quantity required and Price. Remember to add any postage and don't forget your Membership Number or we can't process your order. Payment in STERLING by Cheque (drawn on a UK bank), P.O. Euro Cheque or Cash. Make cheques payable to *FORMAT*. Payment **MUST** be in same envelope as order. Send to *FORMAT*'s address on page 3. Normally dispatch is at the same time as your next issue of *FORMAT*. We will not be held liable for delays or non-delivery due to circumstances beyond our control.